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**IMPACTS OF BART ON BAY
AREA INSTITUTIONS
AND LIFESTYLES**

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APRIL 1979

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16. Abstract <p>his report focuses on the effects of BART on the Social Institutions and Life Styles of Bay Area residents. The project addresses the impacts of BART on three primary institutional spheres and their clients: local political institutions including community responses to BART; Institutions of Higher Education and their students; and Health Care Institutions and their clients. At the institutional level, case studies are designed to assess BART-related changes in the organization of institutional activities, and to determine changes in the social experience and expectations of their participants. The study of life style impact focuses upon direct and indirect impacts of BART upon the use and experience of different transportation modes, commuters, household routines, family routines, and the family as an institution. BART has had limited impacts on Bay Area life styles and social institutions. It has had the greatest impact upon commuters from suburban residential communities to the central business districts of San Francisco and Oakland.</p>			
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BART IMPACT PROGRAM
IMPACTS OF BART ON
BAY AREA INSTITUTIONS
AND LIFE STYLES



FINAL REPORT

DOCUMENT NO. DOT-BIP-FR 10-6-77

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PREPARED FOR
U.S. DEPARTMENT OF TRANSPORTATION

AND
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

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Alistair Sherret of Peat Marwick Mitchell & Co. has been very helpful in providing us with necessary travel behavior data.

Lastly, this work would not have been possible without the conscientious participation of our user panel members and our community key informants.

SPONSOR'S NOTE

The BART Impact Program was a comprehensive, policy-oriented study and evaluation of the impacts of the San Francisco Bay Area's new rapid transit system (BART). The program began in 1972, and was completed in 1978. Financing for the Program was provided by the U.S. Department of Transportation, the U.S. Department of Housing and Urban Development, and the California Department of Transportation. Management of the Federally-funded portion of the Program was vested in the U.S. Department of Transportation (DOT). The Metropolitan Transportation Commission (MTC), a nine-county regional agency established by California law in 1970, administered the Program as prime contractor to DOT; the research was performed by competitively selected subcontractors to MTC.

The BART Impact Program studied the broadest feasible range of potential rapid transit impacts, including impacts on traffic flow, travel behavior, land use and urban development, the environment, the regional economy, social institutions and life styles, and public policy. The incidence of these impacts on population groups, local areas, and economic sectors was measured and analyzed.

The results of the BART Impact Program have been synthesized in BART in the Bay Area, the BART Impact Program Final Report (PFR). That report was prepared by MTC and presents MTC's conclusions from and interpretation of the Program's findings. In addition to the PFR, final reports for each of the individual projects in the Program were prepared by the consultants who conducted the research. The reports are listed at the end of this Note. The final reports are supported by numerous technical memoranda and working papers. The conclusions in those documents reflect the viewpoints of the respective consultants based on their research.

Readers of BART Impact Program reports should be aware of the circumstances and the setting in which BART was planned and built and the conditions under which the Program was conducted. An understanding of these factors is critical for interpreting the Program's findings and attempting to apply them to other areas.

First, it is important to note that the San Francisco Bay Area has a sound economy, a good system of highways and public transportation, and distinctive land use and development patterns shaped by the Bay and the hills around it. BART was approved and built during a period of vigorous growth in the Bay Area. The economy was expanding, suburban development was burgeoning, and major increments of highway capacity were being added. Also, the Bay Area already had extensive public transportation services. There were public carriers operating dense networks of local transit services on both sides of the Bay, and there was frequent transbay bus service from many parts of the East Bay to San Francisco. In 1972 before BART opened, approximately 10% of the total daily trips in the three BART counties were made on transit. All of these factors made it difficult in the study to isolate BART's effects from other influences that were affecting such things as travel behavior and urban development.

A second important point is that BART was planned and designed primarily to facilitate travel from outlying suburbs to downtown areas. Multiple stops are provided in the major central business districts, but in other respects BART is

more like a commuter rail system (with long lines and widely-spaced stations) than a New York or Chicago-style subway system of interlocking crosstown lines and frequent stops. The BART system was intended to rival the automobile in comfort, speed, and convenience. Contemporary issues like energy conservation, air quality and service for the transportation disadvantaged were not widely recognized and publicized concerns during the period of BART's design.

The institutional setting in the Bay Area was a third important influence on BART's development. BART was developed as a separate institution without full coordination among existing transportation and regional development planning agencies. BART's planners had to make assumptions about policies and development, many of which turned out to be contrary to policies ultimately adopted by municipalities in the BART District.

A critical element in the study design of the BART Impact Program was the definition of the No-BART Alternative (NBA), the regional transportation facilities and travel patterns judged most likely to have evolved by 1976 if BART had not been built. The definition of an NBA was essential since the Program defined an impact as the difference between what actually occurred with BART and what would have resulted without BART. One cannot be certain about what the region would have been like had BART not been built. But based on an analysis of the political and economic decision history of the Bay Area and the professional judgment of those involved in the Program, it was determined that no significant changes to the area's freeway and bridge systems as they actually were in 1976 would have occurred without BART. It was concluded further that the public transit network and services would have been very similar to what they were just before the start of BART transbay service. One consequence of this assumption is that the NBA provides lower levels of service and less capacity than the with-BART system, and attracts fewer riders. The NBA does not extrapolate beyond 1976 and does not consider how much additional capacity in the transportation system might eventually have been required because of increasing travel demand and congestion.

An important factor affecting the findings was that BART was not operating at its full service level during the period of study by the BART Impact Program. The frequency of trains, their operating speeds, the reliability of their operations, and the capacities provided in peak periods of travel by BART were considerably lower than those originally planned. Trains were running on 12-minute headways instead of the 4.5 minutes originally planned for each of the four lines (90 seconds where three lines converged). BART did not initiate service on all lines simultaneously in 1972 but instead phased in service. The most critical link, the Transbay Tube, was not opened until late 1974. Night service did not start until the end of 1975, and Saturday service started in 1977. Direct Richmond to Daly City service still is not operating, and it now appears that "full service levels," when they are attained, will not achieve the headways and average speeds announced in the original plans.

The final point is that BART had only been operating for a relatively short period of time when its impacts were studied. The impact assessment largely depends on data collected in the first four years of BART's operations. It is likely that some of its impacts, particularly those relating to urban development, will require more time to mature.

Final Reports

These documents are available to the public through the National Technical Information Service, Springfield, VA 22151:

Metropolitan Transportation Commission, "BART in the Bay Area. The Final Report of the BART Impact Program," MTC, 1979.

Gruen Associates, Inc. and DeLeuw, Cather & Company, "Environmental Impacts of BART," MTC, 1979.

Peat, Marwick, Mitchell & Co., "BART's First Five Years: Transportation and Travel Impacts," MTC, 1979.

Jefferson Associates, Inc., "Impacts of BART on Bay Area Institutions and Life Styles," MTC, 1979.

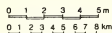
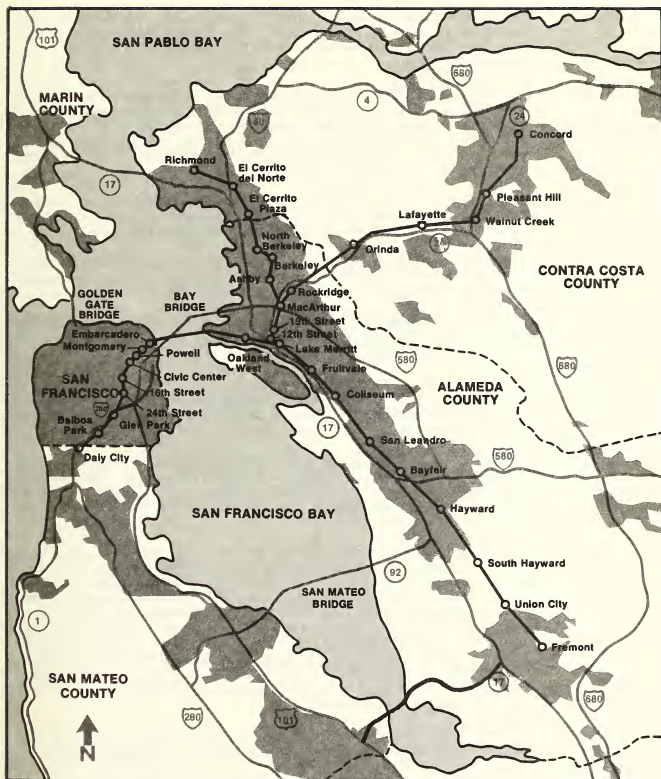
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John Blayney Associates/David M. Dornbusch & Co., Inc., "Land Use and Urban Development Impacts of BART," MTC, 1979.

Booz, Allen & Hamilton Inc., "The Impact of BART on Public Policy," MTC, 1979.

Urban Dynamics Associates, "Implications of BART's Impacts for the Transportation Disadvantaged," MTC, 1978.

Alan M. Voorhees & Associates, Inc., "Federal Policy Implications of BART," DOT, 1979.



- BART:** The Bay Area Rapid Transit System
- Length:** The 71-mile system includes 20 miles of subway, 24 miles on elevated structures and 27 miles at ground level. The subway sections are in San Francisco, Berkeley, downtown Oakland, the Berkeley Hills Tunnel and the Transbay Tube.
- Stations:** The 34 stations include 13 elevated, 14 subway and 7 at ground level. They are spaced at an average distance of 2.1 miles: stations in the downtowns are less than one-half mile apart, while those in suburban areas are two to four miles apart. Parking lots at 23 stations have a total of 20,200 spaces. There is a fee (25 cents) at only one of the parking lots. BART and local agencies provide bus service to all stations.
- Trains:** Trains are from 3 to 10 cars long. Each car is 70 feet long and has 72 seats. Top speed in normal operations is 70 mph with an average speed of 38 mph including station stops. All trains stop at all stations on the route.
- Automation:** Trains are automatically controlled by the central computer at BART headquarters. A train operator on board each train can override automatic controls in an emergency.
- Magnetically encoded tickets with values up to \$20 are issued by vending machines. Automated fare gates at each station compute the appropriate fare and deduct it from the ticket value.
- Fares:** Fares range from 25 cents to \$1.45, depending upon trip length. Discount fares are available to the physically handicapped, children 12 and under, and persons 65 and over.
- Service:** BART serves the counties of Alameda, Contra Costa and San Francisco, which have a combined population of 2.4 million. The system was opened in five stages, from September 1972 to September 1974. The last section to open was the Transbay Tube linking Oakland and the East Bay with San Francisco and the West Bay.
- Routes are identified by the terminal stations: Daly City in the West Bay, Richmond, Concord and Fremont in the East Bay. Trains operate from 6:00 a.m. to midnight on weekdays, every 12 minutes during the daytime on three routes: Concord-Daly City, Fremont-Daly City, Richmond-Fremont. This results in 6-minute train frequencies in San Francisco, downtown Oakland and the Fremont line where routes converge. In the evening, trains are dispatched every 20 minutes on only the Richmond-Fremont and Concord-Daly City routes. Service is provided on Saturdays from 9 a.m. to midnight at 15-minute intervals. Future service will include a Richmond-Daly City route and Sunday service.* Trains will operate every six minutes on all routes during the peak periods of travel.
- Patronage:** Approximately 146,000 one-way trips are made each day. Approximately 200,000 daily one-way trips are anticipated under full service conditions.
- Cost:** BART construction and equipment cost \$1.6 billion, financed primarily from local funds: \$942 million from bonds being repaid by the property and sales taxes in three counties, \$176 million from toll revenues of transbay bridges, \$315 million from federal grants and \$186 million from interest earnings and other sources.

March 1978

*Sunday service began in July, 1978

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SUMMARY

THE BART IMPACT PROGRAM

The BART Impact Program is a comprehensive, policy-oriented study and assessment of the impacts of the San Francisco Bay Area's new rapid transit system, BART. It covers the entire range of possible rapid transit impacts and includes major studies of the Bay Area's transportation systems, travel behavior, land use and urban development, the environment, the regional economy, social institutions and life styles, and public policy. The impacts are defined, then measured and analyzed by their effects on population groups, local areas, and economic sectors.

THE INSTITUTIONS AND LIFE STYLES PROJECT

The Institutions and Life Styles project (ILS), one of six major studies in the Impact Program, is concerned with the impacts of BART upon the life styles and families of its users and on the functioning of key social institutions in the area. Life styles have been defined as the distinctive ways in which individuals or groups spend time and money. Social institutions are structured settings, such as schools, for the organization of routine interactions which underlie the fabric of society. The mobility provided by transportation improvements can encourage people to participate in new activities and change their consumption patterns, resulting in a change in life style. Mobility improvements can also result in the enrichment of the recreational and cultural life of the region and an improved quality of life for residents. Changes in travel patterns might also alter the clientele, staff, and provision of services of social institutions. The purpose of the ILS project was to investigate the impacts on life styles and social institutions resulting from the transportation service provided by BART.

During the time of this research, BART did not run on weekends, and late night service (8 p.m.-midnight) first began early in the project. The frequency of trains, the reliability of their operations, and the capacities provided in peak periods of travel by BART have been considerably lower than those planned. Direct service on the Richmond to Daly City transbay route has not yet begun, though it is scheduled for 1978.

Accessibility and mobility benefits provided by BART affect only a small portion of the region's population. It is most successful at performing the service for which it was primarily designed: the provision of comfortable, high-quality commuter rail service from the suburbs to downtown employment and educational centers. Its impacts on leisure activities and social institutions have been small. Increased impacts of this type may be expected with the initiation of weekend service and improved feeder service to recreational, cultural, and social service centers. Several such centers will become more accessible to BART with the opening of MUNI Metro service. The San Francisco Municipal Railway (MUNI) will, in 1979, initiate service connecting the streetcar lines which serve areas of southern and western San Francisco directly to downtown BART stations. The opening of direct BART service between Richmond and San Francisco and improvements in system reliability, travel times, and headways should also increase

BART's impacts on mobility and, consequently, impacts on life styles and institutions. Effects would also be accentuated by rising fuel or parking costs or other disincentives to auto use.

Methodology

Because the present social impacts of BART were expected to be small, this research was designed to be exploratory. Interviews were conducted with small numbers of BART users to investigate BART-produced changes in their routines and activities or in their experience of transportation. Interviews also probed to discover any consequent effects on the mobility or schedules of other family members. Special sub-populations of interest (youth, elderly, shoppers, recreational and holiday users), and managers and administrators of local community businesses and social organizations were also interviewed. Study of the area's social institutions focused on health care and education; and clients and administrators of several hospitals, colleges, and universities close to BART were interviewed. Community response to BART in the form of neighborhood political organizations was investigated in two case studies. Additional community case studies focused on BART's social impacts in three communities representing downtown, urban, and suburban settings.

Project findings offer some insight into the life style factors which influence the choice of BART for various travel purposes, the importance of BART in the lives of those who use it, and its potential for impacts on life styles and institutions.

Life Style Influences on the Choice of BART

BART riders are disproportionately young and highly educated. About 62% of the riding population on BART are between the ages of fourteen and thirty-four, while only 40% of the BART District population are in this age group. Eighty-one percent of BART riders have at least some college education, while only 40% of the population were in this category in 1970. These statistics reflect the age and educational distribution of people engaged in activities that produce 70% of BART trips, mainly work trips to white-collar jobs in the central cities and school trips.

Persons with some job flexibility (usually white-collar workers in high-status jobs) are more likely to choose BART for the work commute than are workers whose jobs demand fixed, regular hours (particularly blue-collar workers). One reason for this is the highly variable scheduling uncertainty that goes with using BART.

Younger single persons and younger family units are more likely to take recreational outings and excursions. This group is also more likely to travel on BART for recreational trips.

Impacts on Use and Experience of Transportation Modes

Bay Area Rapid Transit is experienced as less convenient, less flexible, and slower than the automobile for non-work and non-routine travel. For trips involving more than one person, it is more expensive than a car, and is perceived that way except to locations where parking is expensive.

The car is overwhelmingly preferred as a travel mode for nighttime travel. While BART is preferred over the bus for travel at night, use of BART at night is constrained by feelings of uncertainty and insecurity connected with fears of being stranded after the last train leaves and what is perceived by some as a "sterile" and unfriendly environment. This feeling arises from the automation of the system and relatively low nighttime patronage, which means there are few people in the stations and on the platforms. The automation of the BART system also results in a requirement to read signs and instructions which is a problem for some BART riders, particularly those who do not speak English and those with little formal education.

BART is perceived, particularly by car owners, as being more comfortable, physically and socially safer, less filled with odors, and as having a better class of patrons than the bus.

BART has very limited impact on the style and frequency of car use or the extent of car ownership. Only a small portion of commuters report savings associated with use of BART and decreased use of the automobile. Most regular BART commuters do not consider the relative cost and savings of BART versus the automobile as factors in their routine commute travel.

A number of BART users report concerns with the environment or with conservation of resources. They feel that they are encouraged to use BART because of a commitment to these values. However, users also report a conflict between concerns with cost, time, and convenience of modes and their commitment to BART and ecology. This conflict is generally resolved in favor of the car.

Effects on Commuters

BART is most competitive in time and cost for long trips to the white-collar central business district employment areas of San Francisco, Oakland and Berkeley. BART is used for the work commute primarily by white-collar and service-sector employees. Its route alignment, service hours, unreliability, and the lack of adequate feeder service constrain its use by blue-collar employees to blue-collar employment areas.

BART influences the timing of work trips and the work-related experience of regular commuters. Commuters sometimes adjust their travel schedule to build in a time allowance for BART's service unreliability. Some BART riders adjust their work start and finish times in order to avoid peak hour crowding on BART.

BART changes the pace and ambience of the work commute with its special quality as a transitional space between home and work. A majority of the commuters report that BART leaves them more relaxed when they return home from work than their former travel mode. Several of the BART commuters report time savings from doing work in transit.

While adjustments in household routines such as an earlier departure for work occur in response to BART use, they are not always identified as such because they are small and quickly become integrated into a new standard routine.

BART is used by some, but not a large segment (generally less than 10%), of the students commuting to institutions of higher education accessible by BART. Time and cost

constraints of feeder connections to and from BART limit the attractiveness of BART for commuting students. It has limited impacts on the life styles of most students who use it. BART makes it possible for a limited number of transit-dependent students (particularly those residing in suburban areas) to attend regular or special college courses, by providing transportation where no previous transit alternative existed.

Impacts on the Desirability of Residential Neighborhoods

Sixteen percent of the BART users in the panel reported that BART was a consideration in their choice of residence location. BART facilitates the choice by persons with urban jobs of what they perceive to be comfortable, secure suburban neighborhoods. Suburban members of the panel and those in outlying urban areas also perceived BART as contributing to the value of homes in their neighborhoods.

Impacts on Shopping

The influence of BART on shopping patterns is limited by a dominance of home- and automobile-centered life styles and the lack of weekend BART service. BART does influence a small increase in shopping trips to the central business districts of San Francisco and Oakland. This is a preliminary, exploratory result. A more systematic and extensive investigation of impacts on shopping is being conducted by another of the Impact Program projects, the Land Use and Urban Development project. Its findings will be reported separately in 1978.

Impacts on Recreational and Leisure Activities

BART is used for trips to the Oakland Coliseum, a main center of athletic and entertainment activities, especially for events that appeal to young people. Youth under eighteen (particularly in areas not well served by other public transit) are more likely to use BART for recreational and cultural trip purposes than adults. Single persons, youthful households, and transit dependent persons are also likely to employ BART for a variety of leisure trips. BART is sometimes used by these people for shopping, visiting, or recreational trips in connection with the work trip. A majority of persons in the service area have used BART occasionally for sightseeing or non-specific recreation, and it is an attraction for tourists and visitors.

Most recreational trips by adult car owners are trips that would have been taken without BART, with the possible exception of some after work and lunch hour trips. BART probably encourages trips by the young to new destinations. Other transit dependents feel strongly that they would make more trips if BART ran on weekends.

Reduced fare holiday service promotions influenced a significantly greater number of group and family trips than regular BART service. Trips which would not otherwise be taken are stimulated by the combination of reduced fare and promotion of the entertainment at the destination, such as the joint promotion by BART and the circus. Also evident on these occasions is a change in people's image of BART as a recreational vehicle rather than as a commuter mode.

The full impact of BART on recreational travel will not become evident until full weekend service goes into effect and possibly hours of night service are extended.

Impact on the Family

BART provides mobility and independence for one-car families where one or more family members use BART to commute to work.

BART significantly enhances the mobility, independence, and access to a variety of experiences for youths who live in areas where previous transit routes were inadequate, and partially frees parents of youthful BART users from the need to chauffeur their children.

BART encourages family visiting by transit-dependent persons with nuclear and extended family relations in the service region; in particular, it stimulates visits by youths with separated parents, and grandparents, and encourages visits with family members at their places of work at lunch time or after work. BART is not used for the majority of family visiting trips, which are mainly car trips, usually taken during the weekend.

Institutions of Higher Education

While BART's impacts to date on colleges and universities have not been great, the system effectively supports a previously existing pattern of student commuting. Student use of BART at the four institutions where access data were available ranged from 6% to 16%. The highest usage was at Golden Gate University, a graduate institution in downtown San Francisco offering evening classes, with a student body consisting primarily of employed professionals. Many of these students combine a school and work commute.

Five of the ten institutions studied had either advertised their accessibility in BART stations or mentioned BART in their informational brochures. Two had made successful efforts to obtain feeder bus services operated by the local transit districts between their campuses and BART stations. Two had established their own feeder services.

One of these, the University of California at Berkeley, has established a free shuttle service to BART which serves many other trip needs of the campus community. At U.C., 8% of the students commute by BART, with a more substantial number of those who live far from campus using BART. Auto travel to the campus has decreased since BART began operation.

BART indirectly influenced the location decision of Laney College near the Lake Merritt Station in Oakland and, to a lesser extent, the planned downtown campus of the City College of San Francisco.

Health Care Institutions and Their Clients

BART had generally small impacts upon the activities of the health care institutions studied and upon the travel of their clients. The automobile is generally preferred and chosen by most health care patients, with and without their own cars, for travel to health care services. BART's unpredictable travel and wait times and limitations on feeder availability are concerns which appear to be intensified for patients making health care travel choices.

Although hospital administrators expressed interest in BART as a means of lessening community traffic and parking problems, actual capital outlays for feeder services to and from BART were made at only one institution (Kaiser, Walnut Creek).

BART availability influenced the choice of a site for a new Kaiser out-patient facility in Richmond. The site close to BART was chosen over a site in a more substantial commercial and recreational development area with direct freeway access.

Local Political Activity

Residents organized to protect their community life style in two areas close to BART that had been targeted for development. One of these is a predominantly white middle-class community of single-family residences and small business in North Oakland; the other is a predominantly Spanish heritage area of multi-family units and small-scale commercial development near downtown San Francisco. These local political movements perceived BART as a part of a coalition of the interests of big business and of local, state, and federal planners and developers. Both organizations succeeded in persuading city planners to downzone or rezone the targeted areas, resulting in prohibition against large-scale residential or commercial development.

Community Case Studies

Downtown Oakland provides a setting for assessing the impact of BART on the growth and redevelopment of an urban core, and on the image that local merchants and developers have of the area. Merchants and redevelopment officials interviewed felt that planned freeway access and a general upgrading of Oakland's businesses and image are more important factors than BART in the stimulation of business and development. Nevertheless, merchants feel that BART helps to make downtown Oakland more attractive, and stimulates increased foot traffic from work commuters. It also encourages a shift toward more racially integrated patronage in downtown stores, that is, the return of the white shopper. Redevelopment officials cite BART's indirect effect on development; expenditures for the 12th Street Station construction provided community development credits for matching federal funds for the City Center project.

Downtown Oakland is also a community with a concentrated population of elderly people with low incomes. Little use of BART is made by this group of people. This is related to their established patterns and modes of travel, perceived difficulties in accessing stations, and general unfamiliarity with BART. Social service organizations provide BART system orientation services which may result in greater use among the elderly, who may buy BART tickets at a 90% discount.

Walnut Creek represents a growing white-collar suburban bedroom community. BART ridership from Walnut Creek is large, predominantly for work trips to downtown San Francisco and Oakland. Transit service before BART was limited, so BART presently represents a considerable increase in accessibility for transit dependents such as teenagers and the elderly. The levels of BART use by these two groups from Walnut Creek is high compared to system averages. The City of Walnut Creek has also initiated a shuttle bus to the BART Station and the downtown commercial area from outlying residential areas. The shuttles are used by commuters because of an overflow parking situation at the BART

station, and also provide local mobility for persons without auto access. Merchants in Walnut Creek perceive minimal BART effect on retail and commercial activity.

Richmond is an older outer urban industrial area with a predominantly low income minority population. It was hoped that BART would add impetus to the growth of a redevelopment area around the station. BART has had little effect on development or on the community. Low levels of ridership appear to result from the limited employment of Richmond residents in the downtown Oakland and San Francisco work areas best served by BART and the present lack of direct service between Richmond and San Francisco. A planned multi-modal transportation center connected with the BART station, already partly completed, may increase the area's level of activity and development.

In both the high-patronage Walnut Creek area and the low-patronage Richmond area, BART use by youths under eighteen is relatively high. In both cases, the youthful BART riders interviewed came from families where other members use BART, suggesting family reinforcement of BART travel, as well as the presence of accessibility factors that led the elders to use the system.

Conclusions and Implications

BART's largest present social impacts are the psychological benefits of a pleasant travel environment and associated time savings, activities en route, and relaxation for regular, long distance work commuters. Benefits also accrue to youths under eighteen, who generally have lesser car access and more leisure time than adults.

Accessibility improvements due to BART have not been adequate to stimulate large changes in activities of individuals or groups, alter social institutions or revitalize local communities or regional centers. Improvements in BART service, especially the addition of weekend service and greater feeder service, will increase the mobility provided by BART. However, given the dominance of the automobile in the travel patterns of most residents, real impacts on life styles and institutions will not occur without a promotional effort to stimulate BART use for purposes other than the work trip. Indications are that weekend service will stimulate central business district shopping activity and travel to the most well-known and accessible recreation and entertainment centers. Coordinated publicity by BART and potential cultural, recreational, or service destinations and reduced fares for off-peak or group travel are necessary to increase leisure travel by BART. Expanded use of BART by primary and secondary schools for field trips would encourage both BART use and participation in regional recreational and cultural activities. The combined effect of greater BART patronage for non-work purposes and the possible future development of activities near stations or additional transit connections would result in real impacts on regional life styles and institutions.

CHAPTER I

INTRODUCTION

THE BART IMPACT PROGRAM

The BART Impact Program is a comprehensive policy-oriented study of BART's impacts upon different aspects of the BART Service Region. The program is concerned with reporting and evaluating the impacts of BART upon the quality of the environment, land use patterns, travel behavior, public policy, social institutions, and life styles of BART users and the economics of the service region.

Evaluation of the impacts of BART will assist local, regional, and federal officials and planners in evaluating the effects of new rail rapid transportation systems upon the life and activities of a region. A factual baseline will serve to guide further transit development within the region and assist others outside the region in determining the positive and negative impacts of a new rail system. Guidelines for maximizing the benefits of development and minimizing negative effects should be generated by the program research activities.

THE ILS PROJECT

The Institutions and Life Styles project describes the direct and indirect impacts of BART upon life styles and key social institutions within the Bay Area. It describes BART impacts upon shopping, work routines, recreation, and leisure activities, visiting with family and friends, the scheduling of activities, public transit use, styles of automobile use, and ideas and beliefs about transportation and the environment. The project is also aimed at determining impacts of BART upon the organization, administrative policies, and functioning of health care institutions, institutions of higher education, and local political institutions, and its effects on the family as an institution.

Life Styles and Social Institutions

Life styles are considered to be the ways in which different aggregates of people consume the scarce resources of time and money and the meanings these activities hold for their life routines. A new transit system creates new accessibility which may enhance the mobility and experience of transit consumers. In turn, these changes in mobility will be reflected in new activities and small transformations in attitudes and routines.

Social institutions are structured settings for the organization and maintenance of routine social interactions. New access may influence a shift in the clientele (for example, in patients served by health care facilities or students attending colleges), or transit-related developments may act as a catalyst for changes in community norms or values, or for organizational development in support of existing community values (as BART stimulated political activity in neighborhoods threatened by intensive development related to new

BART access). By facilitating the freedom of movement and mobility of family members, new transit may influence the functioning of the family as an institution or change the patterns of family visiting.

Study Purpose

This study of BART's impacts on Bay Area life styles and institutions is intended to help planners and decision makers in other regional settings who seek to tailor transit development to the needs and preferences of transit-dependent and car-dependent segments of the population. In addition it provides a baseline for:

1. Preliminary assessment of the social and institutional meanings of new rail rapid transit development.
2. Determination of the likely trends of system social impacts under conditions of extended service or modifications in transit operation policies.

Organization of the Report

The chapters which follow document the research completed by the Institutions and Life Styles project and present its findings.

- Chapter II describes the theoretical base, research approach, and techniques of data collection and analysis for the study. In addition, it presents abstracted life-style groupings of BART users; these are intended to serve as a base for perspective on findings.
- The first section of Chapter III discusses regional characteristics and BART service and ridership characteristics.

The second section of Chapter III identifies the impacts of BART on various facets of life style: the choice of transportation modes, commuting patterns, household routines and choice of residence, shopping, recreational and leisure activities, and attitudes.

The third section of Chapter III describes BART's effects on social institutions: the family, higher education, health care, and political activity in the BART service area.

- Chapter IV presents findings from case studies which investigated BART's effects on business activity, development, and transit use in three different types of communities along BART lines: downtown Oakland, Walnut Creek, and Richmond.
- Chapter V discusses the study's conclusions and its implications for decisions related to future transit development.

CHAPTER II

THEORETICAL BASE AND METHODOLOGY

THEORETICAL BASE

The Concept of Life Style and Its Application

The concept of "life style" was first applied to the study of man and society in the work of Max Weber, who used it in discussing the effect of status groups upon the consumption activities of the new bureaucratic class (Gerth and Mills, 1958). Style of life was treated by Weber as the distinctive way in which persons who share similar opportunities (class) in relation to the economic sphere of production engage in distinctive forms of consumption. From this perspective, life style interacts with social class position to determine distinctive ways of living.

There has been an increasing interest in recent years among transportation planners in studying the relationship between different types of transportation alternatives and a variety of social factors. This interest arises from concerns with meeting the travel needs of the transit dependent, encouraging a change to public transit among automobile users, and employing transportation development as one facet of urban redevelopment to stimulate the social and economic life of metropolitan regions.

Recent inquiries into the social aspects of transportation system impacts fall within three related areas of interest:

1. What social and psychological factors influence the decision to use different types of transportation modes?
2. What are the effects of different types of transportation systems on the social aspects of consumption, selection of residence locations, work routines, and cultural and recreational activities?
3. What are the impacts of different types of transportation systems on nominally non-quantifiable facts of everyday life: visiting, social interaction, comfort, freedom of movement, ranges of experience, and equal opportunity for access to different parts of a service region?

The life style concept is a flexible and inclusive framework for examining these three types of social facets of transportation system impacts. In periods of rapid social change such as our own, the concept of life style is a sensitive construct for conceptualizing the interaction between new social and physical developments and the organization of peoples' daily routines.

We have chosen to conceptualize life style as the distinctive ways in which persons consume their scarce resources of money and time, including the meanings which these

activities hold for social actors. This combines the traditional Weberian approach with more contemporary approaches which focus upon time allocation or patterning of activities in daily routines (Havinghurst, 1957; Warner, 1963; Handel and Rainwater, 1964; Chapin and Hightower, 1966). The emphasis on consumption of time and money provides a useful construct for transportation impact analysis where primary interest centers on time and cost elements of mode choice and the meanings of different modes for consumption-related activities of shopping, residence location choices, work, and recreation.

In order to provide a focus for in-depth panel research activities and a preliminary framework for conceptualizing and ordering the impacts of BART on life style, we developed this general approach along nine dimensions of routine life activities associated with transportation and transit use. These are:

- Shopping
- Work and work-related routines
- Selection of residence location
- Recreational and leisure activities and experience of the public space
- Visiting with family and friends
- Style and scheduling of routines, including the complementary scheduling of routines among family members
- The experience and use of public transit
- Automobile access and style of auto use
- Beliefs and opinions about transportation, public transit, and the environment

A Typology of Distinctive Life Style Groupings

A number of distinct life style groupings were defined to help in the interpretation of Family Panel interviews. These are defined in terms of one or more of the nine life style dimensions; socio-economic characteristics such as age, ethnicity, household status, and family income; and location within the BART service region. Some of these groupings appear to parallel groupings that have been delineated in other areas through a regression analysis of travel behavior and socio-economic data from census and social service agencies (Bunker, et. al., 1977).

The groupings comprise population segments with distinctive patterns of living that are partially related to their present use of BART. Particularly when looking at life style dimensions of shopping, selection of residence location, visiting with family and friends, and consumption of recreational and leisure goods and services, these groupings tend to isolate discrete sub-populations of the BART users. The distinctive life style characteristics of these groupings suggest the fabric of routine life style characteristics which delimit the types of chosen BART use and the present and potential impact of BART on

the life styles of these segments. A survey of the life style of these distinctive groups, with a short discussion of their distinctive patterns of residence, shopping, visiting, recreation, and work-related routines and patterns of BART and transit use follows below.

Type I: New Suburban Home-Centered

The New Suburban households are located primarily at the outer periphery of the Concord and Fremont lines. Most families moved to these areas during the last one to four years. The decision to move to these locales was based upon the desire for a cleaner, suburban environment with good schools and new shopping areas and public services. These areas are primarily residential communities for a predominantly white population.

Most routine shopping is done within 3 miles of home. Local supermarkets and shopping centers are the prime locations for routine shopping. Shopping is usually done in the morning or afternoons by the housewife or on weekends as a family routine. Shopping at small stores and specialty shops is very limited. Similarly, special trips to the city for shopping are rare. The exception is shopping as a part of the BART work commute to San Francisco. This is a routine activity for a small segment of this group.

Recreation and leisure activities are oriented around the home. Home-centered activities, gardening and do-it-yourself chores predominate. Attendance at movies, concerts, night clubs, and other night life activities is rare. Eating out is generally done in the suburban periphery close to home. Recreational trips to San Francisco are unusual but when made, occasional BART use will occur, particularly among Concord line residents. The main recreational travel activities are family group car outings for outdoor activities close-by, e.g., tennis, golf, and swimming, or for weekend trips to the country, beaches, or the mountains.

Family visiting is an infrequent pastime. Over half these families have been sufficiently mobile to become separated from their kin; they have no close relatives in the region. The only feature of regular family visiting by this group that appears to be BART-related is the use of BART by some suburban youth for visits with separated parents, grandparents, or for travel to visit nuclear family members at their work locations.

Employment for Concord line residents is primarily located in downtown San Francisco and Oakland. Most of these New Suburbanites are employed at white collar jobs in these central city areas. However, a smaller percentage of Concord line residents and a somewhat larger segment of Fremont area residents are blue collar workers with work locations in San Francisco, Oakland, and along the East Bay industrial strip which hugs the San Francisco Bay from Union City to Alameda. Most of the white collar workers have some flexibility or control over their starting work hour, or are not penalized for unplanned tardiness. Among white collar workers, many (over a third) have work which may be done away from the work location. Among the New Suburbanites, organization of routine activities around the occupational priorities parallels a home centered suburban orientation toward shopping, recreation, and leisure. Work based in the central city and the demands of the work routine are the only routine urban facet of these new suburbanites' life styles.

Household income averages above \$20,000, the highest of the life style groupings. Virtually all households have access to at least one car, with multiple-car families being

the mode. With the exception of BART, public transit service is very limited and there appears to be very limited demand from among these New Suburbanites for expanded public transit.

Summary of BART Impacts on New Suburbanites

BART influences the choice of residential location; it makes possible the combination of a suburban residence with central urban employment without the requirement of a driving commute to work. BART also enhances the independence and freedom of movement of suburban youth. BART does not significantly influence the taking of trips to urban areas for non-work purposes, because these trips are not facets of the New Suburban life style, irrespective of travel mode.

Typical Type I BART stations: Walnut Creek, Lafayette, Pleasant Hill, Orinda, and Fremont.

Type II: Cosmopolitan Urban Household

The Cosmopolitan Urban families have lived in locations close to the urban centers or within older suburban areas for a longer period of tenure than most New Suburbanites. Neighborhood tenure generally exceeds five years; among those with longer tenure, owner-occupied older single family homes are the predominant mode of residence. For those among this group with newer residential locations, there are a significant number of renters in multi-family and apartment buildings. BART or public transit were not generally at issue in the selection of locations of residence. Job location, good neighborhood characteristics, and housing values were the predominant reasons offered for residential location decisions.

For these families, primary shopping involves a mix between use of local supermarkets and shopping centers and patronage of small neighborhood and specialty stores. Some of these shopping trips to smaller stores are regularly done on foot, particularly in the Rockridge and Mission 24th to Glen Park areas. Specialized shopping trips to downtown San Francisco and Oakland for goods not available nearby are a feature of this groupings' consumption routines. Some of these downtown trips are BART trips and BART appears to increase the frequency of these downtown shopping trips. Access to the urban centers is considered a virtue but the Cosmopolitans often wish to avoid the problems of driving and parking downtown (particularly in San Francisco).

Recreational and leisure activities for the Cosmopolitans include the local and country outdoor family car outings of the New Suburbanites. However, this group also maintains a connection with urban based recreational activities; they attend movies, concerts, sporting events, theatres, and travel to restaurants in the central cities of San Francisco and Oakland. They may occasionally use BART for travel to the Oakland Coliseum and to other recreational destinations in San Francisco and Oakland.

Family visiting is somewhat more frequent for this group than for the New Suburbanites, as they have more family ties in the region. However, family visiting is still a relatively infrequent activity and visiting is normally done by car during the weekend or on holidays. Among this group, there appears to be a significant component of one-car households

where mobility of family members is enhanced by the use of BART for work trips by one or more family members. Use of BART makes the one family car more available for use for local travel.

The Cosmopolitan families have a somewhat lower average income than the New Suburbanites. Although most family units have car access, car ownership is less extensive than among families in the newer suburban zones. Car travel and use of BART for work trips, travel to downtown, and occasional recreational travel is supplemented by some use of bus transit, particularly in the West Bay. This group is distinguished by a cross-mix of suburban activities and orientations and a greater orientation towards urban and cosmopolitan goods and recreational pastimes.

The Cosmopolitans are primarily employed in central city, white collar positions with some flexibility and control over the hours of work. However, a larger component than among New Suburbanites are employed at educational institutions or within the governmental sector. Also, employment by both adult members of family households is more prevalent among this group.

Summary of BART Impacts on Cosmopolitan Urban Households:

BART is employed regularly for the work commute trip to central city locations in San Francisco, Oakland, and Berkeley. It is used less regularly for specialized shopping trips to the urban centers of San Francisco and Oakland. BART appears to enhance the frequency and ease of these specialized shopping trips. BART is also employed by this group for occasional recreational trips to sporting events at the Coliseum and to cultural and recreational locations in downtown San Francisco and Oakland. BART enhances the mobility and freedom of movement of the one-car Cosmopolitan families where one or more household members regularly use BART for the work commute.

Typical Type II BART stations: Mission-24th Street, Glen Park, and Balboa Park in the West Bay and Rockridge, North Berkeley, and El Cerrito in the East Bay.

Type III: Ethnic Families

This life style group is a regionally dispersed aggregate in terms of residential locations. They primarily reside in older suburban and urban homes and apartments in Richmond, Daly City, Oakland, East Oakland, Berkeley, San Francisco, and Hayward. Public transit access as a facet of residential choice appears to have been an important consideration for a sizeable segment of persons with no or limited car access. For others, selection of home locations was related to friendship or kinship ties, housing value and availability, and other non-transportation factors. Residential tenure at present locations varies from less than one year to over ten years.

Shopping routines among this group are very similar to the patterns of the cosmopolitan and urban aggregate. Shopping is principally done at larger supermarkets and shopping centers close to home. However, there are also secondary shopping trips to specialized ethnic food stores, close to home within regional ethnic centers. Shopping trips are made by foot or car close by and by car or bus with occasional BART trips to more distant regional ethnic shopping areas. The lack of weekend BART service curtails the use of BART for their specialized shopping needs by transit-dependent shoppers among this group.

This group appears, from our interviews, to be very socially active. They engage in a variety of recreational and cultural activities. Recreation appears to regularly include attendance at night clubs, concerts, clubs, dances, athletic events, parties, eating out, with less common trips for bowling, outdoor sports and events, etc. These trips are taken by car, in a friend's car, or where car access is not available, by bus. The non-availability of BART service during late night and weekend periods seems to limit, along with intangible factors of modal preference, the use of BART for these recreational activities.

Visiting with family members is the most distinctive differentiating characteristic of this aggregate. More than among any other group, family visiting appears to be an ordinary and routine feature of the activities of Asian and Spanish heritage families in our panel. Visiting is primarily by automobile on weekends. However, transit-dependent persons within this grouping report regular but infrequent use of BART for family visiting where service is available and convenient to visiting destinations. BART is experienced as facilitating and making more pleasant public transit to the homes of extended family members. For Spanish-heritage households, visiting with friends often includes activities with relatives who are also peers, a feature of kinship which is distinctive and differentiated from the patterns of visiting and recreation reported by other groups.

This group has the highest percentage of blue collar employees and the least control over the hours and scheduling of the workday. They also have a lower median income than the other aggregates from the panel interviews. Most incomes are below \$15,000. Use of public transit is common for those with limited car access among this group (a sizeable segment). However, where cars were available they were experienced as important facets of routine life; esteemed for their style, their comfort, the control over route and timing they provide, and their space as a locus for socializing and going out of town. In this respect, the ethnic aggregate more openly expressed identification with and esteem for the virtues of their private cars than the Suburban and Cosmopolitan groupings.

Summary of Bart Impacts on Ethnic Families

Among this aggregate, BART makes possible more extensive family visiting and more comfortable travel to non-work locations during the week for those persons who lack automobiles. For the group as a whole, the primary use of BART is still for work-related travel to San Francisco or Oakland along densely traveled corridors. As with other groups, BART is selected for the work trip because of its greater comfort and speed relative to the bus. This group, which travels most for recreation, travels at times and to places not adequately served by BART. BART seems to make little impact on the choice of locations of residence. Nor does it appear to influence the taking of more frequent trips to the central city areas for shopping or recreation.

Typical Type III BART Stations: Daly City, Richmond, Ashby, Hayward, and Lake Merritt.

Type IV: The Young Singles

This life style grouping is dispersed throughout the service region. However, this grouping is more highly concentrated in the urban periphery and the older suburban neighborhoods. Tenure of residence is generally short with the exception of those persons living with their nuclear family. This group includes a large percentage of renters and a small segment of home owners.

Shopping is done primarily at supermarkets, but this group reports more frequent shopping trips for non-food items to the downtown areas. Also, BART shopping trips and shopping trips as part of the BART work commute are more prevalent among this group. Shopping for clothes and home accessories seems to be an important feature of routine activities for this segment.

This group reports a great variety of recreational and leisure pursuits. Regular recreational trips include going to movies, discos, concerts, out to eat, parties, sporting events, and occasional nights out in the central city of San Francisco.

This group has a median income which is lower than the median for the region. Employment seems mixed between white collar, central city employment and white and blue collar employment at locations dispersed throughout the region. The principal purpose for BART travel is the work trip, but this group is more likely to combine another trip purpose, e.g., visiting or shopping, with their regular commute. With lower car availability, this group has a higher than average use of and dependence on BART and buses for its routine travel.

Summary of BART Impacts on Young Singles:

BART influences the rescheduling of some recreational, visiting, and family trips to the weekday time frame. BART facilitates and increases the frequency of these trips, particularly for transit dependents. BART appears to have very limited impact on choice of residence location and appears to be somewhat less important for the work trip than for the New Suburban and Cosmopolitan groups. BART is used for the widest variety of activities by this group as a corollary of their more extensive travel for visiting, recreational, shopping, and educational trips.

Typical Type IV BART Stations: Berkeley, North Berkeley, Balboa Park, Daly City.

Type V: The Elderly:

This grouping of senior citizens over 65 years of age, is dispersed throughout the BART service region. However, there are concentrations of elderly who are most frequent users of BART in the urban center of Oakland and in the communities of new suburbia. These persons reside primarily in multi-family and apartment dwellings in the central city areas and in newer single-family homes and apartments in the new suburban region. Tenure of residence is generally long or involved a relocation to a suburban place of residence within the last one to five years. Proximity to family or friends appears to have been the primary criterion for selection of residence location; although, for those persons selecting residences in the last five years, proximity to public transit was sometimes an important consideration.

Shopping is done primarily at shopping centers close to home. Shopping trips for non-car owners often involve being driven by a friend or family member for special weekly or bi-weekly shopping trips. However, this group relies more on small neighborhood stores close to home than the New Suburbanites; unlike the Urban Cosmopolitans, selection of these small stores is based more upon proximity and convenience than upon the selection of specialized foods or goods.

Recreational outings are limited and consist primarily of visiting with family and friends and some outdoor trips by car to locations like Lake Tahoe or Reno. An exception to this

pattern among BART users are non-specific sightseeing and excursion trips on BART, and occasional trips from the urban center to suburban shopping centers.

Occupational factors are less important for this group. About three quarters are retired or semi-retired from positions in the regular work force. Among those employed, vocations vary from skilled blue collar occupations to a variety of white collar occupations.

Household income for this group ranges from \$5,000 a year to over \$25,000. Among BART riders, central urban residents are more likely to have lower incomes and less access to car use while the New Suburban Elderly are more likely to have higher incomes and higher car availability. Use of public transit is widespread where car access is unavailable and transit service is accessible. BART use is highest among this group in the Central City area of Oakland and in the New Suburban area of Walnut Creek, where a special BART feeder from Rossmoor, a senior citizen residential development, facilitates BART use among elderly travelers.

Summary of BART Impacts on the Elderly

Among this group BART impacts are greatest for off-peak travel for visiting with family and friends, among persons with limited car access, and for shopping and recreational trips. Field observers located a significant number of elderly persons who take non-specific sightseeing and excursion trips on BART as an inexpensive form of recreation. Travel for night recreation or leisure activities is rare. Regular commute work use is the primary BART use of employed members of this grouping.

Typical Type V BART Stations: Walnut Creek, Oakland 12th Street, and Oakland 19th Street.

Type VI: Bay Area Youth

Young BART travelers are dispersed throughout the BART service region. However, the travel origins of youth are predominantly in the East Bay service area for high school and college trips from East Bay Richmond line stations. For youth living in their nuclear family unit, residence locations reflect the residential choices of parents. Among this group, the Concord line residential communities are the predominant residential origins of BART travelers. BART is most important for this group as an access mode to high school, private schools, and public and private colleges and universities located close to the BART line. BART appears to be the preferred mode of travel for longer trips to educational institutions close to the BART line, where home-to-BART access problems and cost constraints do not interfere with the selection of the BART mode.

Most routine shopping is done by college students within three miles of home. This group employs a greater reliance on public transit and walking for access to stores for routine goods. However, even those students who lack car access report using borrowed vehicles, or pooling up with other students for shopping trips to chain stores and shopping centers for stocking-up shopping trips. In this respect, patterns of youthful shopping correspond to the shopping patterns of the employed young singles group, although among college students there is greater reliance on health food and specialty food stores for routine shopping for food items.

Recreational and leisure activities are generally oriented around visiting and nighttime outings to movies or concerts in the East Bay area. Occasional use of BART occurs for

recreational trips to San Francisco, which are not frequent. There is a strong emphasis on daytime recreational activities related to athletics such as running, tennis, racquet ball, swimming, etc. Most of this recreational activity occurs close to home or at locations associated with the educational institutions where students are enrolled.

Among younger students, ages 9-18, BART is employed during the summer months for travel to youth hang-out places, and for joyriding around the BART system. This group also employs BART for travel to special lessons, e.g., music and choir practices, related to cultural and educational institutions in the Bay Area. Youth in general employ BART for a wider range of recreational activities than do older adult commuters who regularly use the system. This use reflects their greater transit dependence and the greater amount of leisure time options in the schedules of youthful BART users.

BART is employed for a significant segment of all family visiting by youth between the ages of 9 and 18 and among students from colleges and universities within the greater Bay Area for visits with parents. Because of its relative attractiveness for long trips, BART serves as an important new travel option for family visiting among younger persons without regular automobile access.

Use of BART for access to employment is limited among youth. However, some college-aged youth report using BART as the afternoon link between Bay Area colleges and downtown San Francisco and Oakland employment locations. In some cases, students employ the bus for the morning trip to the campuses and use BART as a quicker and more efficient alternative for travel to downtown job sites in the afternoon period.

Household incomes of students living away from home are the lowest of all groups surveyed, with the majority living on personal incomes below \$5,000. Among youth living with their families it is difficult to assess personal income independent from estimates of household income, which does not necessarily influence youthful BART use.

Summary of BART Impacts on Bay Area Youth

BART is most important for youth, and particularly for suburban youth for whom it provides a new high-quality transit alternative to travel destinations that were not formerly well served by transit. Nevertheless, school trips are the predominant trip purpose for all youth BART trips, with travel to East Bay schools the most frequent purpose. BART provides a variety of new options for access to recreational locations and greatly facilitates the ability of transit-dependent youth to visit their nuclear family members.

Typical Type VI BART Stations: North Berkeley, El Cerrito, El Cerrito Del Norte, Berkeley, Walnut Creek, Richmond, Lafayette.

Implications of the Distinctive Life Style Types

This summary of life style types makes clear that different population aggregates have differing patterns of routine activities. In turn, their patterns of BART use are influenced by the routine order of their life styles. However, among most groups, it is also clear that their life styles tend to revolve around a combination of urban employment and relatively home-centered shopping, leisure, and recreational activities. The predominant use of

BART is for work and school commutes. This predominance partially reflects the trend toward separation of household routines from the downtown central city areas. The Urban Ethnic families and Urban Cosmopolitans make more frequent trips to central city stores and recreational locations. But, among the New Suburbanites, travel to the central city for other than work-related activities is very infrequent.

Further, the life style types reflect our findings that recreational outings to clubs, movies, restaurants, plays and concerts are not often facts of most life style routines. Only the Ethnic families and the Young Singles regularly engage in urban recreational outings. Most Suburbanites confine their recreation to home-oriented or outdoor auto-based activities which have no present impact on the potential for BART use.

The pattern of nuclear family oriented privitism, with routines centered around the nuclear family unit, imply that under present social conditions there are limited regional family ties except among the Urban Ethnic families and among occasional Urban Cosmopolitan and New Suburban families. Similarly, regional, cultural, or recreational activities, with the exception of attendance at regional sports events at the Oakland Coliseum, are not an active force that might serve to integrate regional sub-populations into regular participation in a regional culture. Patterns of BART use even with the initiation of weekend service are likely to reflect the continuing pre-eminence of decentralized suburban life routines. It is only among the life routines of relatively transit-dependent sub-populations, youth, the elderly, the Urban Ethnic and Urban Cosmopolitan one-car families, that BART appears to have penetrating impacts upon more than the work-related facets of their lives. Among the elderly and youth, par alternatives are limited or non-existent, BART provides a new access option for participation in a wider range of shopping, visiting, family visiting, and recreational activities. Among other population segments, automobile dominance insulates persons from the need and desire to make more complete use of BART for non-work and non-routine trips.

Theoretical Base: Social Institutions

Social institutions are structured settings for the organization of routine interactions which underlie the fabric of society. Most social institutions have specialized functions which order the organizational framework of their operations. These functions may be described as falling into three primary categories:

- Performance or delivery of needed services
- Transmittal and generation of social norms and values
- Mobilization of social resources and social actors for social preservation or change

While one of these functions may outweigh the others in any given social institution, all are operant to some degree. In addition, the activity of self-perpetuation or maintenance is implicitly central to the existence of all social institutions.

For our study of BART's impacts upon social institutions within the Bay Area, we have chosen to look at three institutional settings in which one of the primary functions

outlined above is dominant. These are:

- Health care institutions, where the performance or delivery function dominates
- Institutions of higher education, where the transmittal function is foremost
- Local political organization, where mobilization is the central concern

We have also examined BART's impacts upon the family as an institution. All three functions are primary to the institutional purpose and operation of the family.

Health Care

Past studies have revealed that quality and continuity of health care tend to be class or income-related, and that persons from suburban communities and those with higher incomes receive more and better health care services. In an attempt to provide equitable health care to all segments of the population, there is a growing movement toward the comprehensive outpatient clinic which provides a variety of specialized medical services to a dispersed population. Often these clinics provide services on a sliding-scale fee basis and rely partially on state or federal funds for their operation.

With such facilities in existence, the issue of service access then becomes a concern. Does BART, as a new transportation option, facilitate greater continuity and quality of health care (particularly preventive health care) for low-income and highly vulnerable populations such as elderly, ethnic minority, and other highly transit-dependent groups? Have health care institutions themselves made changes to encourage BART access among their patients? This study was designed to address these issues through case studies of five health care institutions and their outpatient clients.

Education

Educational institutions have traditionally occupied a social role as creators and transmitters of social knowledge and values. Historically, access to institutions of higher education has been highly stratified -- until recent decades only a small percentage of the population had access to higher education. Since World War II, California has led the way in the development of low-cost education which, along with the rise in family incomes and changes in the job and occupational structure, has encouraged a democratization of access to colleges and universities.

This study seeks to discover how BART, as a new regional transit system, interacts with this developmental pattern of higher education, how it serves a shift from students in residence to students commuting from private apartments and nuclear family households, and whether or not it makes Bay Area campuses more accessible to populations who are poor, transit-dependent, or who live a considerable distance from campus. Attention is given as well to educational patterns as influenced by BART -- particularly the phenomena of non-continuous education, including simultaneous work/study and college re-entry at later stages in life, and decentralization resulting from a non-resident student body. Administrative responses to the problems of campus access are also considered.

Political Organizations

Local political organizations lack a continuous institutionalized base, and in many cases have only marginal organizations for the mobilization of resources for operation. Usually they rely upon a few full-time or part-time leadership personnel. There is no clear social sanction legitimizing their performance of a social function. In addition, the level of political participation among the American middle and working classes has been low in recent years. What, then, stimulates the creation and maintenance of organized political activity? How is that related to BART or other transportation development and community land use and planning? Through case histories of the political activity stimulated by BART, this study considers these questions.

The Family

A conceptual overlap exists between the study of life styles and the study of changes in the family as an institution. The family is the primary group of institutional membership in physical, temporal, and social psychological terms for most persons. The family unit helps to filter and define role expectations for a large number of social settings, in addition to functioning as the hub of everyday routine activities. If we conceive BART as a force which alters accessibility and potentially changes patterns of mobility, the family is an appropriate place to monitor the impacts of BART upon changes in people's behavior and beliefs.

METHODOLOGICAL APPROACH

The field of institutions and life styles involves highly important but only vaguely defined phenomena, the study of which requires inventiveness in research design and field operations. The substantive premises of this study were explicitly formulated to seek depth, not quantitative breadth, in a relatively new research area. The goal of the methodology has been to develop techniques and new theoretical tools responsive to the nuances of personal and social change in order to facilitate understanding of the actual and potential ways in which BART as a new rail transit system penetrates and interacts with the lives of Bay Area people and the functioning of their social institutions.

BART carries about 3% of all travel within the three-county service region. A random sample of Bay Area population could thus be expected to include a small percentage of BART users and a vast majority of persons virtually unaffected by the system. This study, however, seeks specifically to identify and discover the quality of effects where they are most likely to occur. Therefore, study efforts have been focused on BART users and on institutions whose participants live in or pass through areas near the system. Many of the effects discovered here might be expected to grow in direct relationship to growth in BART patronage and in accordance with institutional connections with the system yet to be established. It can be assumed, however, that the types and qualities of the additional effects would generally be similar to those found by this study.

The project research methodology has three related purposes:

- At a preliminary stage, to establish perimeters of the study and identify promising research sensitizing concepts.

- At a secondary stage, to define and test findings by tapping the subjective worlds of actors differentially located in the social settings of interest.
- At a later stage, to triangulate or seek validation for earlier research findings.

The research was designed as a developmental process with each step dependent to some extent on the fruitfulness of prior steps and the directions which they suggest will be most promising to pursue. These methods intentionally involve the researchers in an active interplay of data and theory, reformulating basic conceptions as necessary on the basis of new information gained in the field. Most of the data, gathered by such methods, are qualitative and not quantitative, since the categories within which quantitative data might be gathered (e.g. frequency of family visiting) are themselves open to constant formulation or reformulation.

The main thrust of the approach has been to seek definition of areas and issues of study through short, focused contact interviews with BART user sub-populations (youth, adult majority, and ethnic minority groups, college students, recreational users, health care patients) and through key informant interviews with organizational members and social service personnel. The contact interviews in combination with the field interviews have served to define the scope of relevant issues and the key sub-populations of interest. The categorical definitions employed for the study are thus responsive to and representative of BART riders and their purposes in using BART.

The short-term contact and informant interviews were followed up by focused, in-depth case studies of BART user households and of social organizations and institutions likely to be affected by BART. In addition, where necessary, the research process has also introduced new focused interview techniques (e.g. in interviews of downtown Oakland and downtown San Francisco merchants) in order to answer specific types of questions about a certain sub-population of interest. These techniques have been eclectic and subject to changes in the course of the study process.

Assessment of Methodology and Reliability

The approach employed here has definite benefits in an area without clear research history and methodologies. The techniques have allowed the determination of social impacts which barely exceed the threshold level within the region as a whole. Social life is resilient and tends to adapt to changes in the environment. Only a methodology focused around seeking out critical effects has much likelihood of tapping developmental social impacts of a new transit system carrying a small percentage of the trips within the region. Further, the use of key informants tends to maximize resource utilization by establishing the most promising settings and most promising issue areas in terms of their susceptibility to BART impacts.

Experience from past studies suggests that in assessing BART impacts upon institutions and life styles, a focused qualitative approach holds greater promise for identification of impacts than does a large-scale regional survey. Previous studies using regional population samples of travelers experienced problems in identifying BART-related travel behavior because of the small percentage of BART users in the population. The ILS work was deliberately designed to skirt this problem by seeking out BART impacts where they are most likely to occur.

Under these conditions, the problems of reliability and validity take on a different character from those related to random sample survey research. For this study, reliability is ensured primarily through three procedures:

- The first involves careful staff selection to employ skilled researchers who are adept at probing to establish wholistic pictures of the travel-related worlds of the actors they seek to portray. The methodological warranty here resides in the skill and thoroughness of the researchers in portraying the world of the respondents.
- A second check on reliability derives from comparisons between actors' portrayals of their routine lives and the reports provided by key informants or implicit in available travel behavior data.
- A third validation technique resides in the opportunity to re-interview the respondents where issues of importance appear clouded or inconsistent.

The sources of validity thus consist primarily of cross-checking available data on one sub-population with interview and key informant data from other respondents, from time-lapsed interviewing, and from observation of behaviors. At a later stage of the research process, a similar triangulation procedure may involve comparing findings from qualitative surveys with the findings from other qualitative or quantitative random sample surveys. Where such cross-checking occurred (e.g. in the area of BART's impact on residential location decisions) there appears to be a high degree of confirmation of this study's qualitative panel findings.

In other cases (e.g. youth field contact interviews), some data appears to be validated by the consistency of research findings over time and in different settings. For example, observational census data obtained in spring and summer identified the same percentage of youth riding the system, and surveys of trip purposes among young riders during spring and summer indicated a constant percentage of trips for family visiting.

Ultimately, validity in qualitative studies results from the success or failure in understanding or revealing the implicit world of social actors engaged in the process of living their lives. Confirmation for these intuitive or empathetic understanding may be found in part through triangulation of research findings through use of differentially placed subjects, secondary data, and analyses for internal consistency. However, even under conditions of such confirmation, the burden of validation must reside in the findings of other researchers in other areas who seek to replicate the study of institutional and life style impacts of new rail transit developments. Although areas may differ to some degree, according to unique regional characteristics, it seems reasonable to assume that there will be some continuity in the type and magnitude of institutional and life style impacts from one area to another.

Data Base and Methods of Data Collection

Population of Interest

For the reasons outlined above, a case study approach was adopted to select different types of BART users, rather than aiming at a representative regional population sample. The institutions and life styles study was designed as a deliberate attempt to look at that affected population and to enumerate the meanings of BART for representative types of life routines among the panel of BART users.

Family and Life Style Field Contact Interviews: N=450

These short contact interviews were designed primarily to discover types of BART use, to gain insight into recreational and cultural uses of BART, and to be used as a source of respondents for the family panel interviews. The instrument was designed to allow quick administration on trains, in stations, or on platforms. Basic information was collected on trip purposes, origin and destination stations, frequency of BART use, occupation, scheduling of observed trip, BART use by other family members, number of persons in household, ethnicity by observational census, and use of BART for educational/recreational purposes. Records were also kept for telephone re-contact of respondents. Respondents were selected during peak, off-peak, and evening periods with the aim of compiling a large, demographically stratified reservoir for selection of family panel respondents.

First Stage Family Panel Interview: N=85

Family panel members were selected primarily from the field contact interview respondents. The selection of panel members was deliberately stratified to include different employment categories, black, white, Latino, and Asian women and men. Cases were selected to exemplify different types of BART users, including work commuters, non-work trip users, and multi-purpose users (work plus other trip purposes).

The panel also included households with 1, 2, 3, and 4 or more members. However, in order to tap populations whose BART impact experience would inform policy-making, some over-selection of multi-purpose users was undertaken. These patterns of over-selection were conceived as strengthening rather than distorting potential panel findings.

In the course of family panel selection, we found that difficulties emerged in identifying and gaining access to blue-collar and minority households. Lower-income and minority households often provided field interviewers with incorrect or disconnected telephone numbers when we requested re-contact information. Also, the low proportion of lower income and ethnic minority families on BART made initial contact with these groups more problematic. We resolved the problem of panel representation for these sub-groups by intensifying our exploration of field contacts and references to gain introduction and entry into ethnic minority and blue collar households.

The family panel interviews were conducted by trained interviewer-ethnographers. While all research personnel were provided with a standardized interview format based upon the nine life style dimensions, explicit instruction was given to achieve a conversational case-study approach to each panel member. Emphasis was placed upon the need for comparable information along the range of life style typology dimensions, and equal concern was expressed over establishing rapport with respondents and adjusting the interview approach and probes to the particular needs and demands of respondents and setting.

In most cases, interviews were conducted in the home so as to gain the most complete participation by respondents and any other household members present at the time of the interview. Home interviews also provided the opportunity for additional clues to neighborhood and residential character and the nature of the terrain between respondent homes and the nearest BART station. Further, the home setting provided a basis for discussing reasons for the selection of a respondent's residence location.

Other interviews were conducted at the workplace when respondent expressed a desire to conduct the interview during the working day. Generally, we experienced greater ease in

gaining access in the workspace and time of middle and upper income respondents than gaining entry to their homes.

The interviews lasted from fifty minutes to two-and-a-half hours. The greater part of the questions related to activities within the work, shopping, and recreational and leisure spheres and the impact of BART and other transit modes on the conduct of these routine life activities.

Second Stage Family Panel Interviews: N=35

The second stage family panel interviews were conducted by telephone with all Phase I respondents who could be re-contacted and where Phase I interview responses revealed the likelihood of BART impacts on household life routines. The panel included 35 members from the first stage. Although some Phase I respondents could not be re-contacted, only one actually refused to participate in the second phase interview process.

Parental Contact Interviews: N=30

Interviews were also conducted with parents of youthful BART users originally contacted in our field youth contact interviews of spring and summer, 1976. The parental interviews were primarily focused upon the meaning of youthful BART use for parents and other family members. These short (15-25 minute) interviews were conducted by phone by the youth contact interview researcher. The interviews provided additional input on the meaning of BART for the organization of family routines and the relative independence or dependence of family members.

Interviews at Recreational-Cultural Destinations or at Stations Near to Recreational Destinations: N=85

Respondents were interviewed at points of contact in a non-systematic random fashion. Most interviews were conducted on special BART recreational promotion days in connection with events at the Oakland Coliseum (primarily the Circus) and during Labor Day, when a reduced fare (25¢) was in effect and frisbee contests were being held at four BART stations.

Youth Spring and Summer Contact Interviews: N=300

A short questionnaire was employed for field interviews with youth, age 9 to 18, in BART stations, on trains, and in the areas just around the stations. This research instrument gathered information on present BART use, opinions, and images of BART, other BART use, use of BART for family-related activities, and parental attitudes toward youthful BART use. It was assumed that re-contacts would be held with interesting cases of youthful BART users and with the parents of these users.

Fall 1976 Youth Re-Contact Interviews: N=50

In order to assess changing patterns of BART use among youthful BART riders and to determine changes in BART impact over time, we re-contacted 50 respondents from the

spring and summer field contact interview panels. These new interviews were conducted to determine present BART use, changes from last interview, family perceptions of BART impact, parental attitudes toward BART use, and BART-related impacts among youthful peers. The interviews also elicited permission to contact respondents' parents for short interviews.

Observational Census

An observational census was conducted at six East Bay stations to assess the age breakdown on non-peak riders. It was our feeling that the Bart Passenger Profile Survey, 1976 (PPS)* which includes some 14-18 year old youth, does not present a complete picture of the youthful ridership of the BART system. Further estimates of the level of youthful patronage were necessary to determine the extent of BART's impact upon youth proximate to BART lines.

Downtown Merchant Interviews: N=166

Preliminary contact interviews, conducted with San Francisco merchants proximate to the Montgomery and Powell Street downtown San Francisco stations were focused around the determination of whether BART had made any noticeable impact on the volume of business or the make-up of store clientele. More detailed interviews were conducted with downtown Oakland merchants after preliminary contacts indicated that BART did have an observable impact on the sales activity, clientele, and imagery of downtown Oakland merchants. Interviews were also conducted with managers or proprietors of recreational and cultural facilities to determine impacts (if any) upon the scheduling of service and program hours.

Institutions of Higher Education: 10 Case Studies

Ten institutions of higher education were selected for case studies. The institutions were selected because of proximity to BART or BART feeders and for their representativeness of different types of postgraduate educational settings.

At each institution, one to five major institutional officials were contacted in personal interviews and/or by telephone. Personal visits to each campus were made by the sub-study director and/or research assistant. Background documents and data collected by the institutions, officials, and student groups were studied where available, and interviews were held with student leaders at some campuses.

In addition, during spring 1976, forty preliminary semi-structured interviews were conducted with students at UC Berkeley, Mills College, and City College of San Francisco, for the purpose of identifying issues and themes to be followed up in later inquiries. In summer and fall 1976, thirty-eight additional open-ended interviews were conducted, including students from most of the other institutions in the sample, according to a structured interview schedule.

*The Passenger Profile Survey (PPS) is described on page 20

Local Political Activity: 2 Case Studies

The methods used in the collection of data included interviews with key informants who were themselves participants in the political process, content analysis of official and unofficial documents obtained from the political organizations and from relevant city commissions, review of local and regional published reports, and review of leaflets and pamphlets distributed by the political organizations. Data collected from the various sources were compared to provide a basis for validation of findings and a perspective for re-interviewing the key political participants. Key informants for the primary organizational data included persons actively engaged in the political organizations under review.

The findings presented reflect the results of the data gathering process for two case study sites, Rockridge Station in Oakland and Mission Street Station in San Francisco, that were identified as prime examples of sustained political organizational activity that had developed around BART and BART-related issues. Field investigations and interviews were conducted in the winter and spring, 1976. In other communities, some limited amount of community participation, letter writing, and testimony at planning hearings did occur.

Health Care Institutions: 5 Case Studies

Interviews were conducted with administrators and out-patients at five relatively large health care institutions located close to BART stations or in close proximity to a BART feeder connection. Interviews with administrative staff addressed the potential and perceived impact of BART upon patient travel needs and mobility, upon institutional policies and goals, and on resolution of local conflicts centered on traffic or parking problems. Interviewers were principal researchers of the Jefferson Associates' staff, employing an interview format which was relatively informal and open-ended while maintaining a consistency of question content.

Closed-ended, self-completed survey questionnaires were administered to 575 health care patients and visitors at the five health care institutions under investigation. The survey approach was aimed at an out-patient population which could take advantage of a full range of transportation options. Thus, we sought respondents, who were relatively mobile and who were keeping previously scheduled appointments, as the population which shared the greatest potential for incorporating use of BART or other public transportation into their health care routines. The targeted population represented a ten per cent sample of each facility's total daily caseload by surveying at selected departments for one or two days.

Other BART Impact Program Survey Data

The results of several surveys of travel behavior and attitudes conducted by the BART Impact Program and by BART were available to the project. The most important of these was the BART Passenger Profile Survey (PPS) of 1976. The PPS is an annual on-board survey of BART patrons designed to provide statistically reliable information about the demographic characteristics and travel behavior of users of the system. The 1976 survey was conducted jointly by BART and MTC in late May. The survey was conducted from 6 A.M. until 3 P.M. and an additional survey of evening patrons was conducted on-board

the twelve trains in service during the evening period. Interviewers tallied the race, age and sex by observation of all patrons who received a questionnaire. The data file was then weighted for response bias in terms of race or ethnic identity.

SELECTED DEMOGRAPHIC CHARACTERISTICS
OF
FAMILY PANEL AND BART RIDERSHIP

The following tables provide selected information on the demographic composition of the Family Panel and BART Ridership for certain key demographic characteristics. These data provide a contextual base for the findings on BART's impact on the life styles of its users.

TABLE 1

SEX OF BART RIDERS

&

FAMILY PANEL

(Figures In Percentages)

	FEMALE	MALE
FAMILY PANEL	43	57
BART RIDERS (ALL DAY)	47	53
BART RIDERS (AM PEAK)	51	49
BART RIDERS (OFF PEAK)	46	54
BART RIDERS (EVENING)	28	72

SOURCE: 1976 PASSENGER PROFILE SURVEY (PPS) -
(WEIGHTED TO ELIMINATE BIAS RESULTING
FROM DIFFERENTIAL RESPONSE RATES.)

TABLE 2

FAMILY PANEL
BART RIDERS BY RACE
(Figures In Percentages)

	ETHNICITY			
	BLACK	WHITE	SPANISH HERITAGE	ASIAN
FAMILY PANEL	9.0	72.0	11.0	8.0
BART RIDERS (ALL DAY)	11.2	72.7	5.9	8.4
BART (AM PEAK)	11.5	71.7	5.5	9.7
BART (OFF PEAK)	10.9	73.5	6.4	7.1
CENSUS ESTIMATE	12.0	67.8	12.6*	7.4 ⁺

SOURCE: 1970 CENSUS
1976 PASSENGER PROFILE SURVEY (PPS) - (WEIGHTED TO ELIMINATE
BIAS RESULTING FROM DIFFERENTIAL RESPONSE RATES.)

*SPANISH LANGUAGE OR SPANISH SURNAME

+ASIAN AND OTHER NON-WHITE

TABLE 3

FAMILY PANEL MEMBERSHIP
BY OCCUPATIONAL CATEGORY

EMPLOYMENT CATEGORY	NO.	PERCENT OF PANEL
WHITE COLLAR MANAGERIAL, PROFESSIONAL	35	47
WHITE COLLAR NON-PROFESSIONAL	20	27
BLUE COLLAR	14	18
HOUSEWIVES	3	4
RETIRED	3	4
	75	100

TABLE 4

AUTO OWNERSHIP AMONG
PANEL FAMILIES

		NUMBER OF AUTOMOBILES			
		0	1	2	3 OR MORE
PERCENT		24	29	39	8
NUMBER OF HOUSEHOLDS		18	22	29	6
					100%
					75

TABLE 5

AUTO AVAILABILITY FOR BART TRIP

ALL BART RIDERS*

(Figures in Percentages)

	NO	YES
ALL BART RIDERS	38	62
BART RIDERS (AM PEAK)	32	68
BART RIDERS (OFF PEAK)	44	56
EVENING	48	52

SOURCE: 1976 Passenger Profile Survey (PPS)

*THESE PERCENTAGES REPRESENT PERSONS WHO REPORTED WHETHER A CAR WAS AVAILABLE FOR THE TRIP THEY WERE MAKING ON BART.

TABLE 6

FAMILY PANEL
HOUSEHOLD SIZE AND TYPE OF BART USE

	HOUSEHOLD SIZE	TYPE OF BART USE*			TOTAL PERSONS BY HOUSEHOLD SIZE
		WORK	WORK AND NON-WORK	NON-WORK	
NO. PER CENT	SINGLE	5 21.7	10 43.4	8 34.7	23
NO. PER CENT	TWO	8 38.0	10 47.7	3 15.3	21
NO. PER CENT	THREE	2 16.7	7 58.3	3 25.0	12
NO. PER CENT	FOUR OR MORE	15 79.0	2 10.5	2 10.5	19
TOTAL SAMPLE SIZE		30	29	16	
PERCENT OF TOTAL		40%	38.7%	21.3%	

*INCLUDES REGULAR AND OCCASIONAL BART USE.

CHAPTER III

FINDINGS

INTRODUCTION

Distinctive Regional Characteristics

The San Francisco Bay Area has a geographically dispersed population of about 4.8 million* people and no cities with over one million residents. The population of the three counties where BART is located (Alameda, Contra Costa and San Francisco) totals 2.4 million. Although it is a West Coast center of banking and financial services and a hub for agricultural and port-related warehousing and distribution, and although it is proximate to the Santa Clara Valley home of the semiconductor industry, the Bay Area has been in a period of relative decline in manufacturing and related industries. Service and management activities provide a growing share of productive employment in the region. The San Francisco Bay Area thus lacks the concentrated population density and manufacturing base of other urban centers with which it is often compared.

The primary resources of the Bay Area are its physical beauty, its moderate climate, its place at the confluence of major watersheds, and its historical status as a center of commerce and cultural activity. San Francisco's main industry is tourism and tourist-related services.

Transportation Within the Region

The public transportation network of the Bay Area is well developed. In the East Bay counties of BART operations, AC Transit (Alameda/Contra Costa Transit District) provides bus service, including transbay service. In San Francisco, the MUNI system (San Francisco Municipal Railway) operates street-cars, trolleys, and buses throughout the city.

The private resources committed to automobile transportation and public commitment to the automobile as the preferred transportation mode are very high. The average household spends about 15% of its personal income on car ownership and operation. (Hertz Corporation, 1976). Within the three-county BART area, auto transportation is the dominant mode, but auto use and access varies within different areas of the region and according to the financial resources of the residents.

*Estimated 1975 nine-county population from the Association of Bay Area Governments, Provisional Series 3 Projections - Population, Housing, Employment and Land Uses, San Francisco Bay Region, Berkeley, March 1977.

TABLE 7

**PERCENT OF HOUSEHOLD MEMBERS 16 & OVER
WITH DIRECT MOTOR VEHICLE ACCESS IN 1971****

<u>Income</u>	<u>San Francisco</u>	<u>East Bay BART Counties</u>
All Households	50%	74%
Less than \$10,000	40%	63%
Over \$10,000*	72%	83%

*The largest percentage of BART users falls in the over-\$10,000 income category (1976 Passenger Profile Survey (PPS), Metropolitan Transportation Commission, 1976).

**Income figures are based upon household income. All figures are estimates. SOURCE: Foley, 1972.

BART: Its Present Service Characteristics

One of the main purposes of initiating the BART system was to help prevent inner-city deterioration by providing a vital link between the area's employment, government and recreation centers, and its suburban residential communities. The system radiates along four vectors from a central point in downtown Oakland, following primarily the rights of way and routes of the main automobile and transit arterials from the suburban peripheries of Contra Costa and Alameda Counties into San Francisco. It was conceived and built as a suburban commuter rail system, with wide station spacing in suburban areas and a low ratio of stations (34) to line miles (71). Within the central cities of Oakland and San Francisco, however, stations are closely spaced, and BART's function approaches that of a conventional urban rail rapid transit system.

Current service characteristics affecting BART ridership are the following:

- BART operates Monday through Friday between 6:00 a.m. and midnight; weekend service is planned to begin early in 1978.
- Fares are structured to encourage system use, especially by those making long commutes. The highest one-way fare is \$1.45 (from Concord to Daly City), and the lowest is 25¢ for short trips in San Francisco. Free discount tickets are available for children under 12, senior citizens, and physically handicapped patrons. Trains run on headways at current downtown intervals of six minutes (during peak periods) to twenty minutes (evening) when the system is running smoothly. It is planned that as equipment reliability and patronage increases, intervals between trains will become shorter.
- Scheduled travel time between the Fremont terminal station and downtown San Francisco (about 33 miles) is 43-47 minutes. Between Concord and San Francisco (29 miles), travel time is similar.
- Direct service is currently available from the suburban residential areas of Concord and Fremont to San Francisco. Direct service to San Francisco from Richmond, El Cerrito, and Berkeley has not yet begun, but is planned to begin in 1978.

BART's present ridership travels primarily to destinations in the central business districts of Oakland, San Francisco, and Berkeley. Two-thirds of the present system passengers travel to the employment and educational centers served by seven stations in these areas. Some 70% of all BART trips are taken for work, work-related or educational purposes, and most riders on the system are regular users (three or more times a week). Although the Bay Area is a tourism center, official estimates of recreational and tourist travel on the BART system are relatively low.

BART functions mainly as a suburban commuter line during the peak periods of travel (7-9 a.m. and 4-6 p.m.). However, as 46% of all its travelers ride during the off-peak periods, BART functions largely as regular public transit during off-peak hours at all locations along the BART line.

Station Access

The ways people use BART differ with the contextual settings and transportation alternatives of the urban and suburban communities it serves. In the central urban areas, the automobile shares dominance with extensive bus and trolley networks, and within San Francisco, downtown Oakland and Berkeley, BART stations have no parking lots. Ready station access from nearby homes is primarily by bus, in a car driven by another, by bicycle or on foot. In the suburban peripheries of the system, BART has become part of a world clearly oriented to car travel. Public transit routes are limited in most cases to BART feeders and downtown shuttles, with limited Greyhound service in Contra Costa County and limited AC Transit service in outer Fremont line suburban areas. All suburban BART stations provide parking lots, and BART access is mainly by auto.

Bart Passenger Profile Survey data (1976) show that 70% to 90% of the passengers originating travel from downtown stations during the morning peak period take buses or walk to BART, compared to 25% of those entering the system along the suburban Concord and Fremont lines. Over the system as a whole, 36% of the morning peak period patrons walk or use bus access to BART, while 61% do so during the off-peak period, reflecting increased off-peak access by foot or public transit in suburban areas. For regular work trips, however, almost 50 percent of BART patrons use the automobile or carpools for access to BART.

THE CHOICE OF BART AS A TRAVEL MODE

Choice of BART relative to other modes of travel is greatest along the Concord line for trips across the Bay to San Francisco. High corridor traffic volumes and the difficulty of parking at central city travel destinations combine to encourage BART use along this corridor. The other high-density travel corridor with high BART patronage is the Daly City line, which brings commuters into San Francisco from the south.

Factors of convenience and location are generally more important than social and psychological variables in choices of travel mode, and the choice of BART over car and bus modes is primarily based upon consideration of travel time, cost, and location of origins and destinations. Nevertheless, Bay Area consumers with similar travel origins and destinations differ in their selection of travel modes. Certain social factors appear to be related to this mode selection process.

BART Riders: Socioeconomic Comparisons With Area Population

In order to determine socioeconomic factors which may affect BART use, it is useful to compare the distribution of BART riders to the 3-county population. However, there is no recent socioeconomic information on the Bay Area population since the 1970 U.S. Census. In order to partly compensate for distortions in comparisons with 1970 Census data, 1975 estimates of the age, education, and income distributions in the three BART counties were made by examining national trends in these characteristics. (See Figure 1). There is no basis, however, for judging the more current racial/ethnic distribution in the BART area. For that comparison the 1970 Census has been used.

The age distributions show a large proportion of BART riders between eighteen and thirty-four. The overrepresentation of these age groups on BART is probably a reflection of the composition of the downtown work force and college students, the two major groups traveling on BART. The survey of BART riders probably underrepresents the under eighteen age category, as riders were surveyed only until 3:00 in the afternoon when high school students are in school. Persons over sixty-four are underrepresented among BART patrons. Interviews with elderly residents indicate that older persons make fewer trips in general, that they tend to make shorter trips that are not served well by BART, and that they prefer a more familiar form of transportation - a bus or automobile.

The higher level of education of BART riders is probably also due to the composition of the downtown work force and the number of college student commuters. The household income distribution of BART riders is not significantly different from the general population, suggesting that BART riders are over-educated in a highly competitive job market.

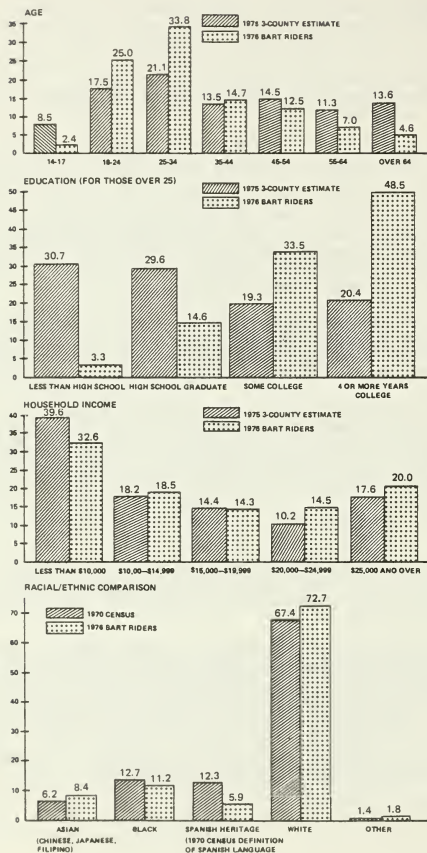
The BART riders are closely representative of the three-county population in terms of race and ethnicity except in the case of persons of Spanish heritage. Interviews with community service workers indicate that lower BART use by the Spanish heritage population may be partly due to the fact that persons who do not read English well or at all have trouble with BART's automated equipment and detailed written instructions.

BART Use by Car Owners

The Passenger Profile Survey found that over half of BART riders have cars available for all trips made on BART, and over two-thirds of the morning peak period riders could choose to travel by car instead of using BART. The level of car ownership among family panel members is even higher (Table 4).

Among car owners in the panel, there is almost uniform agreement about the relative access virtues of the automobile in comparison to BART or other public transit. The car is described as providing flexibility of scheduling, convenience, and control. Most car-owning panel members claim knowledge of the fastest ways to travel between their regular origins and destinations by using back streets or alternative routes during the rush-hour period, and they consider the speed and efficiency of car travel to be one of its primary virtues. Also, the car is perceived as less expensive than BART for group or family trips. Nevertheless, panel members admit economic constraints on using their cars for routine trips.

FIGURE 1
CHARACTERISTICS OF BART RIDERS AND THE 3-COUNTY POPULATION *



SOURCE: METROPOLITAN
TRANSPORTATION COMMISSION

* The age, education and income data is from the 1970 Census adjusted to 1975, based on examination with national trends in these characteristics. There is no basis, however, for adjusting 1970 racial/ethnic census data.

The primary use of BART by car owners occurs during the rush hours when individual control over the pace and speed of auto travel are severely limited by the traffic density along main corridors. BART is perceived by regular commuters to downtown San Francisco as more economical than car travel because it saves out-of-pocket expenditures for parking and bridge tolls. Additionally, the majority of panel members consider BART to be more relaxing and comfortable for rush hour travel than their automobiles.

Under present service conditions, BART has only a limited impact on the non-routine travels of most panel members with cars. The only regular exceptions to this pattern appear to be occasional shopping and recreational trips to the central business districts of Oakland and San Francisco and trips to the Oakland Coliseum. For these trips, BART relieves the traveler from problems of negotiating city or Coliseum traffic congestion and parking. More limited use of BART occurs for trips to institutions of higher education; in these cases BART is chosen because of parking problems or because the trip is connected with the work trip. Other non-routine uses of BART by car owners are quite irregular. The convenience of the car combines with the expense of BART for group travel to encourage a de-selection of BART for non-work and non-educational trips.

The car is clearly preferred as a nighttime travel mode among panel members. The enclosed and predictable character of the car is experienced as protection against the uncertainty of the streets. It affords privacy as well as independence from the hours of transit operation, and it eliminates the insecurities of late-night waits for transit vehicles.

The BART Market Segments Study (BART, 1975) suggests that persons with strong attachments to their automobiles as attractive objects are a special sub-population with a very low level of BART use. Responses from the panel car owners support this view. Few positive affective statements were made about the beauty, fun, or excitement of cars. Statements about the difficulties of driving and parking and expressions of concern about the effects of auto use on environmental quality were much more frequent among panel members.

Major Constraints on BART Use

Car owners and transit-dependent persons both provide insight into the limitations of BART as a new facet of public transit. They identify four areas of constraint upon their taking more and different types of trips on BART: characteristics of unreliability and inconvenience, hours of system operation, fare policy, and service priorities.

Unreliability and Inconvenience

A lack of equipment reliability makes travel on BART unpredictably time-consuming, and the inadequacy of feeder access in suburban areas is a source of inconvenience for some BART users. These characteristics may cause transit-dependent users as well as car owners to de-select BART as a transit mode.

Lack of schedule reliability makes use of BART more difficult for people with fixed regular work hours who are penalized for late arrival (typically blue collar workers) than for people who have flexible hours or more control over their work schedule.

Regular commuters with car access make adjustments in routines to allow for BART travel time along the trip to work, although they often consider that, because of its

unreliability, BART is an unthinkable alternative to the car for non-work trips. The limitations of feeder service have little impact on their patterns of BART use because of their options of driving to the BART station or being dropped off by a family member.

The wait, travel, and transfer time which are untenable for the car user are within the realm of possibility for the transit-dependent segment of the panel, although they may deselect BART because of the unreliability of its service compared to that of AC or MUNI. The inadequacy of feeder service can be a serious obstacle to BART use for transit-dependent patrons.

Hours of Operation

Those most likely to use BART for a variety of trip purposes report the inadequacy of present BART operations in failing to provide weekend and late night service. Transit-dependent panel members want to travel during the weekend for leisure activities and household errands. The assurance of late night service would eliminate worry about shortening trips or becoming stranded late at night. The present variability in the time of the last BART train from different station areas seems to increase the uncertainty and fear of being stranded and may serve to suppress nighttime use of BART.

For regular car users, BART is more easily accepted as a daytime, week-day vehicle. Auto users ordinarily conceive of nighttime and weekends as regular times for car trips. There are some reports of desire to use BART for weekend and late night trips, but to a lesser extent than among transit users. There is little indication that expanded service hours would cause significant changes in patterns of BART use among car owners.

Fares and Ticketing Policy

The limit on present BART service hours combines with the absence of off-peak and/or group discount fares to discourage use of BART by groups. Only 15% of BART users report traveling in groups, including travel to and from work during peak periods. For regular use, even by a single person, BART fares are not competitive with those of AC Transit and MUNI, and where there are few out-of-pocket car expenses for bridge tolls and parking, BART is perceived as noncompetitive with car travel for two or more persons. Some panel members reported that BART use by their families would change significantly with weekend service and the institution of a reduced fare or discount group ticket program.

BART tickets are available for full-fare users in 25¢ to \$20 denominations at BART stations. However, BART discount tickets for senior citizens, the physically disabled, and youth under 12 are available only at certain banks (downtown banks and some branch offices near BART). The senior citizen tickets afford a 90% fare discount: a ticket with a face value of \$6.00 is vended for 60¢. The handicapped and youth tickets provide 75% discounts, with the \$6.00 tickets being sold for \$1.50. The non-availability of the discount tickets in the stations serves to suppress use of the system for unplanned journeys by seniors, disabled and youth, thus the ticketing system is biased toward routine travelers. This may account in part for the relatively low BART ridership among persons 65 and over.

The discount ticketing policy is not well publicized, and the non-availability of the discount tickets in the station is not widely understood. This is experienced by panel

members with families as a constraint on family outings and on the freedom of youth to make trips by themselves. Senior citizens who are accustomed to bus travel must first be introduced to BART before they are likely to seek out discount tickets through the banks. Better information and orientation programs and increased convenience for purchasing discount tickets would enhance the appeal of BART for these potential off-peak patrons.

Service Priorities

Under interim operating conditions, BART provides direct trans-bay service from stations along the Concord and Fremont lines. Persons traveling to San Francisco from stations on the Richmond line must change trains in Oakland. The disparity of service is perceived as an inequity by regular transbay travelers on the Richmond line. The Richmond to Berkeley segment of the BART line traverses an area with high concentrations of ethnic minorities, while the Concord line serves primarily white residential suburbs. This perceived inequity in BART service priorities was expressed by a relatively small number of panel members.

A lack of BART service to blue collar employment centers has also been perceived as an inequity in station siting and hours of operation. The West Oakland station, for example, would better serve the large concentration of factory workers, longshoremen, and military personnel who work in the area had it been built two miles to the west of its actual site. Because of its service hours, BART similarly fails to serve the 2,700 day-shift employees of the Fremont General Motors Assembly Plant. The day workshift begins just after 6:00 a.m. and BART service starts too late to transport these people to work.

IMPACTS OF BART ON LIFE STYLES

As a new transit mode, BART contributes to the reorganization of social patterns by effecting subtle changes in the way people organize and view their daily routines. The family panel interviews provide evidence of such changes and indicate some of the specific life-style changes resulting from the use of BART. These are discussed below according to the activities affected: commuting to work or school, choice of residence and household routines, shopping, and recreational and leisure activities. The symbolic and psychological effects of BART (the image it conveys, how it changes the experience of the public space, and its effects on transit-related feelings of insecurity) are discussed last within this section.

Effects of BART On Commuting Patterns

It is in the area of work-related BART use that we find the most consistent and uniform evidence of BART's impacts on the routines of its riders.* Since the work trip is the primary trip purpose of 66.8% of all daytime BART users (PPS, BART, 1976) this can be viewed as a statement about the nature and effects of the most prevalent form of BART use.

*See Table 3 in the Methodology Chapter for the composition by occupational category of the Family Panel.

To a large extent, the observed BART impacts on commuting routines are related to its access and operational characteristics as a travel mode new to the area. These impacts fall into three categories:

1. Changes in the scheduling and time of the work trip. This includes changes in the departure time for work and the timing of the return trip, changes in the scheduling of the time frame for the work day, and changes in the elapsed time spent traveling (time gained or lost).
2. Changes in the pace, ambience, and sense of time of regular commuters. This is created by changes in the timing of work trips combined with the particular characteristics of the BART travel mode.
3. Working in transit and changes in the organization of work.

Changes in the Scheduling and Time of the Work Trip

Reports of changes in the scheduling of work trips with regular BART use follow a somewhat consistent pattern. Among former bus riders, BART is experienced as an occasional time saver. Among most persons who compare BART use with automobile access to their work places, BART is reported to be from 10 to 30 minutes slower than the same trip by car. Some car owners, however, experience BART as a timesaver when it runs without mishap.

BART work commuters appear to adjust to the variable scheduling and travel time of BART commute trains. Those who have control over the hours of their workday are likely to change their hours of regular work so that they can avoid the crowding and frequent delays of peak-period travel. Commuters report starting for work as much as a half hour early to guard against late arrival. However, for blue collar and white collar workers who do not have control over their work schedule, pressures exist either to adjust their schedules, allowing leeway against travel delays, or to discontinue BART use.

Feeder service inadequacies may also affect the planning of routines among both car owners and transit-dependent BART riders. Fremont feeder service, for example, stops at 7 p.m., which may necessitate returning from work earlier than desired. For car owners, the limitations of feeder service may mean leaving home earlier to ensure a parking place in the crowded BART parking areas along the suburban periphery (particularly along the Concord line), or a family member may have to drop off or pick up the BART user.

While it is evident that BART requires routine morning and evening schedule adjustment among its regular users, in most cases respondents have difficulty identifying what actual reorganization of routine activities they implement to accomplish the schedule changes. Nonetheless, they recognize changes in how they feel about traveling to and from work.

Changes in Pace, Ambience and Sense of Time

Social economist Steffan Linder (1970) has observed that a change in people's relationship to time accompanies the process of industrial development in advanced industrial nations. Proliferation of development results in a proliferation of options and alternatives for the use of time. Moreover, as one rises in the socioeconomic hierarchy, time becomes more valuable in both the productive sphere and the leisure sphere of consumption. "Hurry, Hurry . . .there just isn't enough time."

Contrary to the demands for efficiency which accompany the increasing scarcity of time among affluent white collar workers, BART unreliability has required an element of surrender of one's control over time maximization. To some extent, then, the choice of BART as a travel mode involves a tradeoff of time effectiveness for other considerations; factors of cost, and relative comfort and ease appear to figure into the calculated choice of BART for the regular work trip. But this act of choice did not appear, at least in the first stage panel interviews, to lessen the exasperation BART patrons felt over the unreliability of BART service or their sense of harassment and helplessness during delays of the system.

Initial responses among regular BART users were strong in their reaction to the unreliability of BART service. The variability of train travel times from day to day reportedly made it very difficult to budget one's time when using BART. A trip from the suburban periphery could take 35 minutes one day and an hour another day. This resulted in the changing of travel modes for some members of the family panel. However, the majority of panel members reacted by finding ways to maximize their control over the time necessary for their regular work commute on BART. The patronage volumes at some origin stations along the system's lines reflect the resultant trip planning: Oakland West, for example, the last station before crossing under the Bay to San Francisco, experienced an increase in peak period patronage over the last year, with many of these patrons coming from locations far from the station area. Regular BART patrons have found that this method of getting to work allows them to receive the BART benefits of arriving close to their work places without parking expense, while minimizing the chance of delays on BART.

During the four months between first and second stage interviews, interesting changes occurred in some respondents' attitudes toward the BART system. The most profound change appears to be a growing sense of ease and relaxation felt by regular BART commuters.* Users who in earlier interviews expressed extreme irritation at the unreliability of BART and its impact on the planning of their time schedules spoke in different tones in the second-stage interviews. There appeared to be a growing attitude of indifferent acceptance of the BART trip as intrinsically unpredictable and subject to unplanned changes of schedule.

While there are still expressions of frustration and dissatisfaction with system unreliability, there is an apparent socialization of regular BART users into a special BART consciousness involving a temporary surrender in the continual war to maximize one's time. Regular commuters learn to allow for slack time in scheduling regular BART trips. Many regular users report that they usually bring something to read so that BART delays don't really bother them too much.

Along with the acceptance of system unpredictability comes a growing repertoire of "BART humor," whimsical surrender before the uncertainties of BART's computer-controlled system. Delays often bring joking and discussions of humorous BART mishaps which the regulars have experienced in the past. Some regular users remarked about the pleasant aspects of delays--their effect of encouraging people to talk to one another.

*Part of this new tolerance is undoubtedly related to the improvement of BART service reliability over time and recognition of the BART District's commitment to further improve its service.

Long delays appeared to our field observers to result in a substantial increase in conversations, particularly under crowded conditions. An increase in male-female interactions which might otherwise be bound by social protocols of the public space was also observed during system delays.

Working in Transit and Changes in the Organization of Work

Under normal operating conditions, BART is a quiet space for transition between the home and work worlds. The car may also serve as such a space, but only when the pace and substance of one's thoughts and images can be controlled. During rush hour the mechanics of driving through traffic congestion fully occupy one's attention. There is not the option to reflect at length upon the day or to engage in planning other activities.

One-eighth of the regular BART work commuters in the panel report economies from doing work in transit. Three of the 75 respondents reported meditating during their trip home on BART. Two welcomed the opportunity to go over the day's experience at work.

A phone service installer reports going over the log of jobs for the day; a sociologist reads professional journals; an insurance man meets co-workers for conferences in transit; a lawyer reads specialized journals that usually get neglected at work or at home; an environmental specialist plans her day's work, sometimes riding past her destination to finish her preparation; a housewife reports paying bills on BART; and students occasionally use the time for study, or for mid-term or final examination preparation. These small economies alter routines to provide a bridge between home and work and supplement the time available to perform work tasks.

Reports of changes in the organization of actual work activities are less frequent than reports of work being done in transit. These more exceptional events (reported by 3 of 75 or 4 percent of the panel) indicate changes in work activity patterns resulting from BART in combination with other factors. A Concord line businessman reports being able to move his office closer to home in Concord because BART makes Concord accessible to San Francisco; a freelance remodeler reports being able to get jobs in a wider area by using BART plus his bike to get to work locations; an East Bay patron reports that BART makes it possible for him to work two jobs.

Student Commuters

Students commuting to institutions of higher education use BART more irregularly than do work commuters. Factors of transit cost, convenience, and reliability combine with day-to-day variations in class scheduling to make mode switching more likely among school commuters. Among students with car access, travel by auto is overwhelmingly preferred, again because of variations in daily routine and because parking impedances on or near campus are not usually troublesome enough to force a greater shift to public transit modes. Lunsford (1977) has perceived BART as "one alternative element within the student's lifestyle rather than a major new element with a dramatic impact." The main findings on BART use among college students and its life-style impacts are the following:

- Students usually find BART a comfortable environment conducive to study in transit, but these qualities are not of sufficiently high priority to influence the travel mode choice of most students. In this respect students do not differ significantly from the work commuter population.

- For some campuses where BART would be a welcome transportation alternative (particularly California State University at Hayward and San Francisco State University), walking distances or feeder wait and travel times discourage greater BART use. While BART is less than a quarter of a mile from the City College of San Francisco, its distance is perceived by staff and students interviewed as much greater, "over across the freeway, inconvenient to reach and down a steep hill from the campus." The cold and windy days dominant in that part of the city put a premium on MUNI and car travel to the CCSF campus.
- BART increases the life-style options of the student whose campus is accessible from the system, making it possible to live farther from the campus, yet within reasonable travel time. Thus a student can seek an apartment with more space, lower rent, better nearby shopping facilities or a cultural ambience different from that of the campus area. In this way, BART helps to establish a home-to-school relationship for the student similar to the home-to-work relationship of the commuting suburban worker. In both cases there is a dispersal of population from the main activity center.
- For suburban students attending college while living at home and for suburban residents returning to college, BART is a new accessibility link from areas with no previous direct transit services to the area's campuses.

Project youth interviews with persons between the ages of 9 and 18 indicate that BART plays an important part in the educational travel of youth, particularly among suburban and Berkeley-area youth. The greatest impact is upon youth attending private schools close to BART and among youth commuting from new areas of residence to schools in their former residential neighborhoods in order to complete the school year. Of all BART trips by youth under age 19, 30% are to educational destinations: about 8% are trips to private schools and approximately 6% are trips to out-of-district schools. (Minkus, Polk, 1976). In addition, BART appears to facilitate attendance of private lessons and educational and cultural activities, eliminating the need for parental chauffeurs for youth who wish to participate in music and dance lessons and special athletic activities removed from the residential neighborhood. Field interviews indicate, for example, that one-half of the San Francisco Boys' Choir use BART to commute to regular choir practices.

Because the system provides access to destinations not effectively served by other transit alternatives, BART facilitates private school attendance and allows continuity in the routines of youth who have moved to new residential locations. Beyond this, BART expands the mobility and experiential fields of youth under 18; this is particularly true for suburban youth who had no public transit alternatives before BART.

Effects of BART On Household Routines and Choice of Residence

Rescheduling of Household Routines

Adjustments in the work-related routines of regular BART users is the primary source of BART impact on the scheduling of household routines. BART travelers are spending more time traveling and, as one respondent said, "living with it." The adjustments made may be as small as making a morning departure ten minutes earlier and arriving home fifteen minutes later in the evening, or they may involve shifting night and morning household routines and mealtimes to accommodate an hour's shift in the entire work frame.

It has become clear through the panel interviews that riders are making these adjustments in their routines, and that rescheduling is the norm rather than the exception for most regular BART users. However, as with changes in work-related activities, respondents are ordinarily unable to note specific differences in their activities or those of their families which accompany shifts in the scheduling of regular (primary) work trips. The adjustments are either too small or have become sufficiently integrated into the family routines to be experienced as normal. As such, they may not even be experienced as changes caused by external factors.

Partially because it is still new to the area and operating under less-than-full service conditions, many of BART's impacts on daily routines are currently too subtle to detect. Some changes may not be integrated into regular routines because of travel time uncertainties. Some travelers from the Concord and Fremont lines, for example, report time savings related to BART use when trains are running normally. However, the factor of BART unreliability makes it difficult to budget the time potentially saved.

Impacts on Car-Ownning Households

BART has a clear impact upon the scheduling of complementary routines in one-car families where one or both adults work. Most often it encourages routines which facilitate the freedom of movement of family members. A housewife, for example, may now have a car available to accomplish household errands during the day. Where both adult household members work, BART is an added option which may simplify the coordination of daily routines.

Less frequently, BART is a factor which complicates the daily routine. Two housewives on the panel reported irritation at having to drop off and pick up their husbands at the BART station. This irritation appears to stem from the unpredictability of the evening train arrival times. As BART service reliability improves and feeder bus inadequacies are eliminated, such complications may dissolve.

While BART use reduces automobile expenses, these savings tend to be automatically absorbed into the budgetary routine more or less unconsciously.* Since BART's impact on car-related expenses is not perceived as dollar savings, no immediately apparent life style impact can be reported.

Among the panel of 75, seven households report some BART impact upon their plans to purchase an additional car or replace an existing car. Most panel members, however, find that BART use does not enable them to avoid or defer automobile purchase. Car usership is ingrained into the existing routines of car owners, and in most cases BART substitutes for only a small segment of the trips formerly taken by automobile. These conditions tend to render perceived BART impacts upon car ownership and replacement small.

*Moreover, panel members had difficulty estimating their total monthly auto expenses or tended to under-report expenses (compared to official estimates of transportation analysts).

Impacts on Transit-Dependent Households

The existence of the BART system appears to stimulate new or more frequent trips for transit-dependent households, which are primarily single-person households with no complementary scheduling constraints on their freedom to creatively reorganize their routines. Single persons with no (or limited) car access report rescheduling their activities around BART access to take shopping, recreational, and visiting trips during the week rather than on weekends. This often takes the form of triangular trips, with the addition of social visits or recreational side trips to regular BART work trips.

Impacts on Residence Location, Housing, and Values

While it is clear from the panel interviews that residential choices influenced by BART involve a number of other priorities, BART is perceived by 16% of the panel (12 of 75) as an important consideration in choosing a residence. In our findings, BART is usually mentioned as a consideration along with good neighborhoods, safety, quietness, good schools, and other indicators of desirability. When we recognize that the 16% of the panel who report being influenced by BART does not account for the persons who have made no choice of residence since the planned initiation of BART service, the potential for BART-influenced residential choices over a longer period of time is slightly greater. The Residential Response Survey (Deleuw, Cather & Co., 1977) conducted as part of the Environment Project of the BART Impact Program provides further evidence that BART is an influence on residential choice: at the three station sites surveyed (Concord, Daly City and El Cerrito Plaza), 15-22% of the respondents reported that BART was a positive factor in their choice of residence.

Actual attribution of residence choice to BART is impossible to determine. What is important and obvious, though, is that BART serves to support the contemporary choice of suburban residence and urban employment, while replacing the car as a work commuter vehicle with a more socially beneficial public transit mode. BART accounts for approximately 25% of all transbay trips from the Concord corridor (Ellis and Sherret, 1976). In short, BART facilitates the combination of a well-paying urban job with the comforts and secure neighborhood characteristics of suburbia.

Field interviews with residents in Orinda and Rockridge also revealed that BART is perceived as contributing to the desirability and value of homes within the community.

While geometric rises in the prices of single-family housing are occurring throughout California,* what is significant in the Bay Area is the impact of BART upon the definition of desirable residential characteristics. Whether or not BART is objectively responsible for a rise in residence value (as measured by relative sales prices in comparable BART and non-service areas),** it appears to be important in defining residential desirability, new value on direct, fast, and comfortable work access by public transit and possibly establishing new images of transportation which will influence future definitions of residential desirability. The desirability of single-family suburban housing located near BART is linked not to transit dependence, but to the option of not having to drive to work.

*In desirable residential areas of Los Angeles, bank officials estimate the price rise during the period from 1974 to 1976 at \$1,000/month (Daily Commercial News, San Francisco, California, Vol. 196, No. 40, November 30).

**The BART Impact Program's Land Use and Urban Development Project will make a quantitative evaluation of BART's impacts upon sales prices of residential dwellings and on choice of residential location. Results will be available in late 1978.

Impacts on Shopping

According to the Passenger Profile Survey, over one-half of BART riders are non-peak passengers, of whom 7% use BART for shopping excursions. Twelve family panel members (16% of the panel) report using BART for shopping trips on BART which would otherwise not be taken. Thus, it appears that even under interim service conditions, BART has an impact on shopping. Because most households conduct non-essential shopping on the weekend, this impact might be expected to increase under full service conditions.

Interviews with family panel members show that BART changes the nature of non-essential shopping trips. Persons who have the option of car access to downtown shopping locations choose to use BART because it makes the trip easier, more interesting or part of a special outing with friends. BART is a travel option which facilitates and enriches the travel experience and thus encourages more frequent shopping trips to the city centers.

While some car owners report an increase in their shopping trips to the central business district areas since BART, their patterns of routine shopping for essential items do not appear to be influenced. This shopping is usually done at shopping centers and discount markets close to home. Especially among suburban residents who often make routine shopping trips into family excursions, the automobile remains the standard vehicle for these trips. In addition, some suburban respondents have no desire to go beyond their usual shopping areas, because they do not perceive the central business district areas as providing any higher quality, style, or assortment of goods.

Among transit-dependent persons, the impact of BART on shopping routines is viewed as a significant enhancement of consumption choices. However, the lack of weekend BART service is felt as a more serious inconvenience than among shoppers with car access.

Six panel members (9% of the panel) report taking noontime or after-work shopping excursions as part of their regular commuting use of BART. Because many of the downtown garages close or charge additional fees after 5:30 to 6:00 p.m., there are constraints on after-work shopping in San Francisco by the car commuter. This is one of the subtle shifts in life style of regular BART users which is currently difficult to assess, although it can be seen as contributing to an integration of central city work routines with suburban home-oriented activities. It may in turn stimulate retail sales and services within downtown San Francisco.

Impacts On Recreational and Leisure Activities

The Bay Area Awareness Survey (BART, 1976) reveals that for the region as a whole, recreational trips constitute the most frequently reported BART use. Of the 75% of the population who report ever having used BART one or more times; 46% have used BART for recreation, whereas 29% have used the system for work or school trips. The recreational useage is still infrequent, however, amounting to a small proportion (6%) of the trips taken on BART. The data suggest that there is a large reservoir of persons who have used the system primarily for recreational or leisure purposes, but who do not ordinarily travel by BART.

In an effort to stimulate non-routine uses of the system, BART organized a special holiday promotion for Labor Day, 1976. A uniform 25¢ fare was offered for travel anywhere on

the system, and frisbee contests were staged at four station parking lots. BART patronage figures for that day, and this study's survey of the Labor Day BART travelers, suggest a substantial latent demand for utilization of the system as a recreational vehicle. Ridership for the day was estimated at 130,000 paying patrons, a number equal to the usual weekday ridership and without the usual work-trip market.

An important factor in the potential stimulation of recreational BART trips is a reduced fare for families, groups, or off-peak travel. Present fares are prohibitive for family or group travel.

Oakland Coliseum

The BART Bay Area Awareness Study (BART 1976) reveals that the Oakland Coliseum is the most widely recognized landmark destination served by BART, with 90% of the riders and 63% of the non-rider population expressing awareness that it is served by BART. The Coliseum, home of Oakland's professional athletic teams, is also the one recreational destination within the BART service region for which there is clear evidence of BART use shown through the family panel and field contact interviews and by other transportation studies of the Bay Area population. Most persons report using BART to the Coliseum because of the ease and convenience of the BART trip in light of the problems of driving and parking at the Coliseum complex. Leaving the parking area of the Coliseum after an event presents particular difficulty because of traffic back-ups and delays.

BART data on exits from the Coliseum station during August, 1976, provide a good picture of BART use for Coliseum access (Table 7). The events most accessed by BART, the Day on the Green Concerts, appeal to Bay Area youth, who are the most recreation-oriented market group and the most likely to use BART. While it is apparent that BART also draws some of the trips to events (e.g. Lawrence Welk) which appeal to an older set of patrons, the greatest use of BART is for regional athletic events, concerts, or other events that cater to younger riders.

There have been limited BART promotions for the various athletic events at the Coliseum, with a larger and continuous promotion for the Golden State Warriors basketball games. On most evenings of Warriors or Oakland Athletics (baseball) games, the Coliseum station is full of patrons right before game time, and BART has occasionally placed extra trains on the system to handle the load. During a recent promotion, an additional five cars with 72 seats, each with a capacity for 1,080 passengers at a 3:1 load factor, were still not adequate to carry the Coliseum patrons without standees.

"BART Goes to the Circus" was the banner for an extensive BART promotion campaign for the Ringling Brothers Circus at the Coliseum. BART reports Coliseum station ridership of 8,191 for five days of circus performances. Most of the BART Circus travelers interviewed reported that without BART, they probably would have come to the circus by car.

From our field observations and contact interviews, it is evident that BART patrons traveling to the circus and to other Coliseum events travel primarily in groups, while most regular BART travelers (85%) report traveling alone. The groups for the circus trips were usually one or two parents traveling with one or more children. Contact interviews (n=50) suggest that these travelers represent a combination of regular BART users, and new system users.

TABLE 8

**COLISEUM STATION PATRONAGE
FOR RECREATIONAL EVENTS
AUGUST, 1976**

DATES	COLISEUM PASSENGER EXITS	TOTAL PASSENGER EXITS	% OF TOTAL SYSTEM EXITS	COLISEUM SPECIAL EVENTS
8/2	1689	130,601	1.3	No event
8/3	6979	141,928	4.9	Day on Green 6 (Eagles) (Rock Concert)
8/4	1836	132,187	1.4	No event
8/5	1809	132,232	1.4	No event
8/6	2343	132,741	1.8	A's (baseball game)
8/9	1840	133,061	1.4	No event
8/10	2586	134,435	1.9	A's, Gaters (Pro Tennis)
8/11	2094	130,948	1.6	A's
8/12	2114	131,226	1.6	A's
8/13	2717	133,759	2.0	A's, Gaters
8/16	1787	132,447	1.3	No event
8/17	2241	132,076	1.7	Gater Playoff
8/18	3328	129,422	2.6	Day on Green 7 (Jethro Tull) (Rock Concert)
8/19	1731	130,583	1.3	No event
8/20	2573	133,922	1.9	Lawrence Welk
8/23	2071	129,352	1.6	No event
8/24	2473	131,779	1.9	Ringling Bros. Circus
8/25	2975	133,453	2.2	Circus
8/26	3213	133,503	2.4	Circus
8/27	3547	131,392	2.7	Circus, A's
8/30	5954	136,655	4.4	Circus, A's

AVERAGE DAILY PATRONAGE: July 1976 — 1,960

Source: Bart: Data Acquisition System (DAS)

Cultural Activities

Various downtown centers for the visual and performing arts are served by nearby BART stations, and there are some indications that BART is used for access to the exhibits and events sponsored by these centers. However, family panel interviews suggest that these types of recreational pursuits are not frequently features of routine life activities. At best, under full service conditions, BART can be expected to facilitate attendance of these centers by persons with limited transportation choice and to stimulate more frequent participation in the cultural life of the region by providing a pleasant travel alternative for car owners.

BART's 19th Street station in Oakland is near the Paramount Theatre, an historical landmark, home of the Oakland Symphony, and location for a variety of pop, rock, and jazz concerts. The Oakland Museum is served by the Lake Merritt BART station. The San Francisco Museum of Modern Art, the San Francisco Symphony, the Opera, and the American Conservatory Theatre (ACT) are all accessible from BART stations less than three blocks away. Station observers report especially full station areas before and after ACT performances, and on-train observers have reported that following one event 20-30% of the Concord-bound afternoon ridership are patrons returning home from ACT matinees. This gives a rough indication of the potential extent of BART use for attendance of cultural events; further and more detailed study of BART's impacts on the cultural activities of the user population would be appropriate under conditions of full service.

Social Visits

Trips for social visiting are not frequent in the regular travels of most members of the family panel. Most visiting trips taken occur in the evening and weekend time slots, for which BART is perceived as inconvenient and its hours as inadequate. Consequently among car owners, the convenience, flexibility, and security of the car for evening travel all work to support a pattern of car use for most regular visiting. For non-drivers in the panel, BART is used occasionally for visiting with friends. However, the fixed BART service area and the time limits of its interim service tend to constrain non-driver visiting trips as well as those of drivers.

While transit-dependent persons of all ages may use BART to visit friends, the level of visiting via BART is highest among single, young adults who lack car access. Among persons in this category, who go out more frequently than do larger households, visits with friends are often combined with trips to cultural or entertainment locations in downtown San Francisco. A trip by BART to the theatre or to a restaurant to meet friends is perceived as a good travel option by three or four members of the panel. Single adults also report using BART on triangular trips to visit friends after work and before returning home. This use of BART for triangular trips was also observed in the college student interviews and is probably more a reflection of the flexible life routines of single, young adults than an indication of BART impacts on the structuring of life styles. BART does not appear to measurably affect the frequency of visiting even among this group.

Sightseeing and Non-Specific Recreational Outings

Findings from the field contact and family panel interviews suggest that the most frequent recreational trip purposes involve somewhat non-specific trips to the central districts of San Francisco and Oakland. These trips involve outings which combine

downtown sightseeing, dining, meeting with friends and/or shopping into a recreational activity. This non-destination-specific outing is the main recreational use for which there appears to be a large latent demand for BART service during the weekend.

About half of the family panel report taking friends or relatives on BART for sightseeing tours of the region. In spite of complaints about system unreliability, BART is viewed as a technical accomplishment of sufficient marvel and import to warrant a tour when visitors pass through town. This serves to confirm a view of BART as a source of transformation in the regional life style. Particularly during summer months, field researchers report a large number of out-of-town visitors in groups on the system. BART use is often combined with rides on the cable car and, less frequently, with trips on the Sausalito ferry.

As for non-essential shopping trips, it appears that for recreational trips, BART functions as more than a substitute mode for a trip normally taken by another travel mode. BART use stimulates new types of travel among some respondents, and for most panel members the use of BART appears to subtly transform the recreational outing, making it more open-ended than the same trip would be if taken by car. While family panel and field contact interviews and the BART Passenger Profile Survey data suggest that use of BART for travel to recreational and cultural events in the city centers of San Francisco and Oakland is not a prominent feature of present BART use, there is evidence that the availability of BART can make a tangible impact upon the life routines of persons with limited transportation choices.

Recreational Use of BART by Bay Area Youth and Elderly

Spring and summer interviews with Bay Area youth between the ages of 9 and 18 on the BART system (see Table 9) make clear that youth use BART in ways that differ from the predominant use of the system by adults. Youth are much more likely to use BART as a recreational vehicle for a variety of recreational trip purposes, particularly when they live in suburban areas not served by other public transit. BART is used as a mode of access to visit friends, to go to concerts and the Coliseum, to journey to the central city or the youth culture center of Berkeley. In addition, youth between the ages of 9 and 18 are frequent users of the system for "joyriding" and traveling without a specific purpose. These joyriding trips and travel to hang-out places constituted 23% of the travel by youth interviewed on the system during the summer vacation period. BART serves youth as a mode of access to specific recreational locations, a mode for exploration and mapping of the Bay Area, and as an entertainment experience in itself.

Use of BART by youth 18 and under reflects the priorities of youthful life style. Youth operate with a shorter "list" of socially structured constraints on their use of time than that of adults. Because they are under less pressure to make use of their time, youth ride BART as a leisure pastime or to reach new destinations for exploratory trips.

The existence of different time constraints for different segments of the service area population is reflected also in the patterns of BART use by the elderly. Our field researchers noted that among the elderly riders on BART, many were taking excursion trips. The elderly persons interviewed reflected that BART was a good way to see people, get out, and entertain oneself for a small amount of money. Because it offers them tickets at a 90% discount, BART is in the financial reach of most older people. Thus, it is

TABLE 9

YOUTH TRAIN STATION INTERVIEWS TRIP DESTINATIONS

(Percent of Respondents)

SPRING 76		SUMMER 76	
School or lessons	29	School or lessons	7
Visit Family or* Relatives	14	Visit Family or Relatives	14
Visit Friends	10	Visit Friends	20
Shopping	12	Shopping	16
Recreational/Cultural	22	Recreational/Cultural*	11
Joyriding	4	Joyriding	13
Work	2	Work	8
Hang Out Places	4	Hang Out Places	10
Other	3	Other	1

* Includes 6% visits with
Separated Parents

+ If we include joyriding and hanging out, the Summer includes more recreational trips. However, during school youth appear to be more likely to travel to specific destinations rather than traveling for non-specific recreation.

the elderly and youth, with their less rigid time schedules, who are most likely to use BART for recreational purposes.

Symbolic and Psychological Effects of BART

As a new form of transportation, BART is designed to match the technological sophistication of its modern, urban environment. The clean architectural lines and great open expanses of BART station interiors and the streamlined quality of its trains reflect the elegant simplicity of its conceptual form: BART was designed to be a fully automated system of fast, quiet, and comfortable trains running at short, computer-controlled intervals. While its operations to date have been plagued by equipment breakdowns and delays, and although normal operations have never reached the level of service originally projected, the visual forms of BART still promise the simple efficiency of a smoothly operating, automated rail transit system.

The ideal formulation and actual character of the system combine with abstract public concerns and the experience of riding BART to affect the psychological and symbolic experience of many BART riders, sometimes setting up conflicts. Data from the family panel interviews provide preliminary evidence of effects related to ecological concerns, to the relative comfort and ease of BART use, to the principle of automation, and to the nighttime experience of the public space.

Ecological Concerns

About one-third of the panel identify with a commitment to ecological and conservation goals. Ecological concerns are most often expressed by respondents who rely upon car travel, but who consider public transit a positive alternative that should be more intensely utilized. Limited service characteristics sometimes constrain respondents from living out their stated commitment to public transportation. Equally often, there is admission of a real conflict between the flexibility and convenience of the car and the expressed moral commitment to public transportation.

Many BART users who profess their commitment to conservation and public transit also express criticisms of the inconvenience, travel times, or unreliability of BART. These criticisms help them to resolve some of the dissonance they experience when comparing the flexibility and predictable travel time of the car with the attributes of the BART system. Environmental quality concerns are apparently not sufficient in themselves to motivate new patterns of travel and activity.

The Effects of Automation

The lack of human contact and the requirement to read signage in operating the system are problematic aspects of the BART system for riders. The necessity of responding to signs and machine cues is sometimes complicated by insufficient information or unclear signage. Field observers in the stations noted that 1 in 3 passengers tended to pause, fumble, or exhibit some other evidence of confusion in their use of the ticketing and Add-fare machines. The need to read, in moving through an automated system, may result in uneasiness and wariness particularly for the elderly, the new or occasional user, persons who are not native speakers of English, and persons with little formal education. Interviews with social service personnel indicate that the automated character of BART discourages system use particularly by the elderly and non-native speakers of English. Moving through the BART system is an abstract problem for those unaccustomed to its use, and without intervention by the station agent or explanation by a regular user, it can be a confusing and intimidating experience.

Perception of the Public Space and Nighttime BART Use

BART's impact upon the perception of the public space (particularly at night) and its potential for contributing to the revitalization of the public space were two concerns of the family panel interviews. The historical dispersal of central urban populations to the outlying areas of cities in the United States affects the public life of the central city by making it more sparse. Music, concerts, plays, bars, and nightclubs within the central cities have become less populated. This contrasts with public life in the larger cities of Europe and the Soviet Union, where public transit brings nightly clientele to the boulevard cafes, nightspots, cultural events, and recreational centers.

It is clear from the panel interviews that for nighttime travel, BART is experienced as being more pleasant and safer than AC and MUNI buses among both car owners and transit-dependent persons. The very fact that regular car-using suburbanites are willing to travel on BART at night, though they consider the bus an untenable nighttime travel mode, suggests a limited BART impact on the public experience. This represents a small BART impact on the meaning of public transit and public exposure for this demographic subgroup.

Movement in the public space is not, however, a real concern when car access to and from the nighttime destination is conveniently available. The more profound BART impact on the experience of the public space occurs for persons with limited transportation choices. For them, BART is perceived as more pleasant than the bus, more comfortable, safer, and less populated by strange or rowdy persons. These findings along with some direct reports of BART facilitating and/or making possible nighttime recreational activities, suggest the present scope of BART's limited impacts upon travels into the public space, and a positive impact on the sense of safety and security for nighttime public transit users.

There is also evidence, however, of uncertainty and insecurity associated with nighttime use of BART. This appears to be most acute among women, probably reflecting the historical status of women in our society. The long, cavernous quality of BART stations (particularly subway stations), the automated character of the system and the relative absence of other patrons on the platform during evening hours contribute to insecurities, particularly for someone traveling alone.

BART IMPACTS ON THE INSTITUTION OF THE FAMILY

BART Impacts on Family Visiting

BART impacts on family visiting are limited. Most family panel members did not have family ties in the BART service region. Moreover, for most persons with family ties close by, BART was perceived as virtually irrelevant to family visiting. For the majority of those in our sample, the patterns of segmentation and separation of kin that accompany the socially and economically mobile middle class lessen the importance of family ties and family visiting as regular features of their routine lives. While family may hold an important emotional place, family relationships and visiting are not regular hubs of social activity.

When family visiting does take place, it traditionally occurs during the weekend and evening time slots. BART is not available on weekends and is usually not perceived as an access alternative for weeknight trips. Additionally, respondents comment that BART is

too expensive for more than one person; if the whole family is going to visit relatives, "the car is much more economical."

Exceptions to this low impact pattern occur among persons who wish to visit relatives regularly and who are non-drivers with limited travel options. This is most evident among ethnic minorities and among youth between the ages of 9 and 18.

Family Visiting Among Ethnic Families

The social nature of American society is such that the processes of employment and shopping tend to homogenize the activities and pursuits of formerly divergent class and ethnic life styles. Handel and Rainwater (1964), among others, talk about the emergence of a modern working class whose life styles and values appear to merge toward those of the middle class. This pattern tends to create suburbanization of home residence (leaning toward home ownership), increased focus on the nuclear family, and segmentation of the extended family.

Aspects of this trend are apparent in the family panel interviews with blue collar families. Nonetheless, a substantial segment of our interview panel of blue collar households were ethnic households whose extended family ties and resulting patterns of family visiting differ from those of white majority families. Among Latinos and Asians, family visiting is described as a regular feature of routine life activities. There is some divergence from this pattern among the black families interviewed, but the place of family and family visiting appears to be somewhat more prominent among all ethnic family groups than among whites.

BART does influence and alter the family visiting patterns of a subsegment of the ethnic families within the family panel. For ethnic families with two cars and two adult drivers, the choice of the automobile as the vehicle for family visiting and family trips tends to parallel the majority mode preference. However, BART enters the routines of older ethnic family members, non-drivers, and younger single persons with limited car access as a facilitator of increased family visiting and increased ease of travel for family visits which might have been taken by other modes. Thus, BART reinforces and supports a life style orientation toward family visiting.

Family Visiting Patterns of Youth

While we found only limited mention of use of BART for meetings between youth and their parents in the adult family panel (2 cases out of 75), the use of BART for nuclear family visiting was revealed in the youth and parental recontact interviews as a fairly routine pattern of BART use by youth. BART facilitates visiting among youth and their nuclear family members at a frequency which would otherwise be difficult or impossible to sustain. This pattern of BART impact on familial visiting is consistent with observed BART impact on adult family visiting: for persons with limited travel options, BART is a facilitator.

Six percent of our spring youth respondents report using BART to visit with separated parents. Particularly where there is potential tension or social distance between the two family units, BART appears to provide an effective travel option for youth who wish to maintain contact with parents in other households.

Growing Independence of Youth

There is an increasing trend within American society towards the segmentation of the activities of family members. In some respects, California represents the fullest extension of this trend. Mothers, fathers, sisters and brothers have their own segmented activities and associations. BART facilitates the creation and sustenance of early autonomy for youth without their own cars.

Despite the exposure and new independence which BART creates for youth, parents are generally supportive of BART use by youth because they consider it socially safe public transit. In this respect, BART is experienced by some parents as the public vehicle of the middle class. It is free of the negative associations that suburbanites hold toward the public bus system. (Minkus, Polk, 1977).

In some cases the reasons for parental support of BART use are very specific. Some youths report that BART use is encouraged by their parents for travel to private schools or to music lessons. In fact, without BART, attendance of private schools for some students would be very difficult.

Family-Related Impacts on BART Use by Youth

Case study interviews with Walnut Creek and Richmond youth suggest that BART use by youth is related to patterns of BART use by others in the family. Walnut Creek area youth interviews suggest that BART is a routine facet of travel in Walnut Creek to a greater extent that is true in other settings. Most of the youth interviewed while using BART reported that other family members use BART, with one-third of the respondents reporting that either their mothers or fathers commute regularly on BART.

TYPE OF BART USE BY FAMILY MEMBERS

Youth Interviews, N=34

<u>Mom/Dad Commute</u>	<u>Mom/Non-Commute</u>	<u>Dad/Non-Commute</u>	<u>Sibling/All Purpose</u>
13	21	0	23

All of the Richmond respondents report that other family members use BART for commute or non-commute travel, suggesting a similar pattern of family reinforcement for BART use. This appearance of BART use as a family phenomenon in an area where BART use by the general population is relatively low suggests that youth are influenced to use BART by the significant use of this system by others in their family environment.

The socioeconomic circumstances of the family appear to be related to the ways in which young persons use BART. In general, Richmond area youth (predominantly from lower-middle-income, blue collar families) view BART in more pragmatic terms than do suburban youth (from middle- and upper-middle-income families) interviewed in the case studies work. Their use of BART tends to be less exploratory, more trip specific, and somewhat more cautious. This differentiation seems clearest with younger respondents. In Richmond we found no parallel for 11- and 12-year-old Walnut Creek riders taking BART to explore in San Francisco and Berkeley.

Research conducted in the Cambridge, Massachusetts area (Gurin, 1976) suggests that exploratory use of rail transit by youth may be a class-related phenomenon. Gurin argues that middle-class suburban youth possess a greater sense of competence and security in dealing with unknown facets of the external world. As a consequence, they are likely to seek out the unknown and uncertain, whereas lower-middle-class and working-class youth approach the world with a lesser sense of "worldly" competence and employ greater caution in exposing themselves to unknown facets of the regional world.

While our sample sizes are too small to make a strong statement about regional and class-related trends, the data in Richmond and Walnut Creek tend to confirm a class-based interpretation of BART travel by young persons. However, the availability of discretionary spending money may be of equal importance with feelings of confidence in determining the range of exploratory travel among youth.

Further information on BART's impacts on families and on the life styles of BART users can be found in the Institutions and Life Styles Project Technical Memorandum, Social Impacts of BART on Bay Area Families and Life Styles (Minkus, Polk, 1977).

IMPACTS OF BART ON BAY AREA INSTITUTIONS OF HIGHER EDUCATION

The impacts of BART on the colleges and universities in the Bay Area were studied through exploratory interviews with administrators at ten major colleges and universities (Figure 2), through campus access information (including survey data) supplied by universities, and through field observation on campus and in BART trains and stations. Results show that while BART's impacts to date on institutions of higher education have not been great, the system effectively supports a previously existing pattern of student commuting.

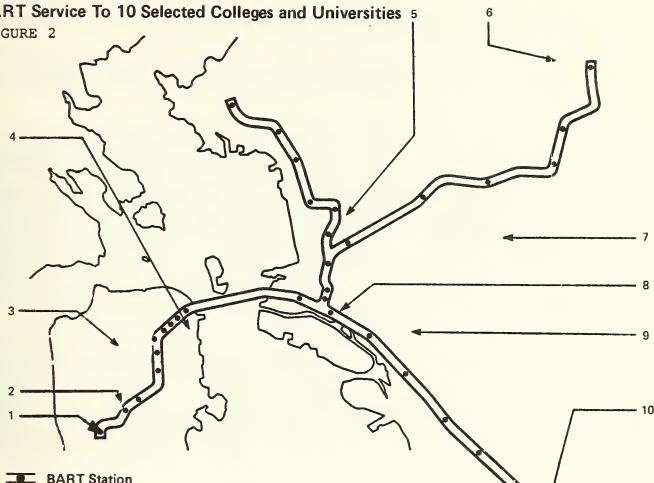
Because of moderate weather, the predominance of automobile use, and the existence of a public system of education with campuses in most localities, California has not developed a tradition of private, residential colleges like that found in the eastern United States. In addition, many California colleges were built or expanded during the last decade when high interest rates and rising costs have made the construction of student residences prohibitive. With the exception of small, private colleges (such as Mills College in our sample), California urban area schools have long chosen to build relatively few residence halls at their campuses and have relied instead on home-to-campus commuting by their students. Some campuses, such as U. C. Berkeley, are surrounded by large numbers of student-occupied, commercially-run apartment buildings and private homes, so that a high proportion of students can walk or bicycle to classes. Others, such as California State University at Hayward, have no on-campus student housing, and draw most of their students from residential communities some distance away.

The BART system functions as one new and attractive option for commuting students, although survey data supplied by four colleges indicate that a small number of students currently use BART for their school commute:

- At City College of San Francisco, a comprehensive community college in south-western San Francisco, 6% of the students and 4% of the faculty and staff utilized BART.

BART Service To 10 Selected Colleges and Universities

FIGURE 2



No.	Name of College	Nearest BART Station	Distance from BART Station*
1	San Francisco State University	Daly City Station and by Muni streetcar	One mile from Daly City. 19 minutes by present streetcar from Civic Center Station
2	City College of San Francisco	Balboa Park	200 yards
3	University of San Francisco	Civic Center	Muni No. 5, 20 minutes
4	Golden Gate University	Montgomery Street	2 blocks
5	University of California at Berkeley	Berkeley	2 blocks
6	Diablo Valley College	Concord	No surface transit (2 miles)
7	JFK University	Orinda	No surface transit (5 miles)
8	Laney College	Lake Merritt	1 block
9	Mills College**	Coliseum	AC Transit No. 57, 18 minutes
10	California State College-Hayward**	Hayward	AC Transit No. 91A or 30 13 minutes

* Muni and AC Transit travel times provided by the San Francisco Municipal Railway and Alameda-Contra Costa Transit District.

** Prior to adjustment for BART station service.

This Route Destination Map is a product of the Bay Area Rapid Transit. It is reproduced here, in part, as a visual aid to assist the reader in identifying the location of case study institutions and their accessibility links with the BART lines.

- At Golden Gate University, a graduate/professional institution in downtown San Francisco with a student body consisting primarily of employed executives, BART was utilized by 16% of the students.
- At California State University at Hayward, a comprehensive college in the southern East Bay Area, 7% of the students and 6% of the faculty and staff used BART to reach campus.
- At the University of California at Berkeley, a major research-oriented university in the urban, north-central part of the East Bay, BART ridership in 1976 was 8%.

The data available from U. C. Berkeley suggest that BART's effect on auto use has been greatest for those making the longest trips; for example, among students traveling six to ten miles to campus, BART use reached a level of 10% in 1976, while use of automobiles for commuting decreased by 31% between 1970 and 1976. Overall effects on auto use appear to be lower: the percentage of all auto commuters to U. C. Berkeley decreased by only 5% (from 20% to 15%) during the same period, at Cal State Hayward, auto use since 1972, when BART began operation, had dropped only 2% among students (from 86% to 84%) and 4% among faculty and staff (from 93% to 89%).

Interviews with students and administrators indicate that BART is usually not a major element in students' decisions of which college to attend. Factors such as tuition costs, programs offered, and the prestige of colleges available figure more prominently in such decisions. However, BART is occasionally a crucial factor in the college location decisions of some students because of the absence of other travel options or their need for public transit access from work or home locations that are served most effectively by BART.

Transit-Related Problems at the Campuses

Campus administrators at nine of the ten campuses indicated they had given some attention to student transportation patterns, including BART ridership. It appears that most of the campuses have experienced similar sets of transportation-related problems. Despite these overlapping areas of concern, however, most of the 33 campus officials interviewed were apparently unaware that other Bay Area campuses had wrestled with problems similar to their own.

Four of the ten institutions had experienced pressures from community residents and/or students to improve on-campus parking opportunities and to free parking space in nearby neighborhoods. Most of these institutions were reluctant to increase on-campus parking because of the wide variations in parking demand over the course of an academic term.

Administrators at five colleges articulated concerns about students' ability to reach their campuses easily and had either advertised their accessibility in BART stations or mentioned BART in their informational brochures. Two institutions, Cal State Hayward and Diablo Valley College, a community college in suburban Concord, had made successful efforts to obtain feeder-bus lines operated by local transit districts between their campuses and BART stations. Two others, U. C. Berkeley and Mills College, a private women's college in Oakland, established their own campus-to-BART shuttle system.

Location Decisions of Institutions of Higher Education

Interviews with administrators indicate that BART directly or indirectly influenced the location decisions for two new community college campuses. BART appears to support a trend toward new growth of downtown urban institutions.

To the east of downtown Oakland, the Peralta College District constructed its new Laney College facility across the street from the Lake Merritt BART station. While campus administrators have argued that BART was not a primary determinant of campus location, community pressure existed for choice of a downtown site accessible by public transit, and the BART station at Lake Merritt became the basis for federal matching funds which were applied to the purchase of this campus site within the Oakland redevelopment area. Campus administrators indicated, however, that savings which resulted from the use of a BART/redevelopment site were offset by the cost of construction over the BART subway passage.

City College of San Francisco is presently building a downtown campus at Fourth and Mission Streets, one block from the Powell Street BART station. This campus is being built because of the trend toward part-time night students who are downtown workers during the day. While BART was not a primary factor in the selection of the site, it was one of the public transit access modes which served to make the site within the San Francisco Yerba Buena redevelopment area a desirable one.

Further discussion of BART's impacts on colleges and universities can be found in the Project Technical Memorandum, Impacts of BART on Bay Area Institutions of Higher Education and Their Students (Lunsford, 1977).

IMPACTS OF BART ON HEALTH CARE INSTITUTIONS AND THEIR CLIENTS

The study of BART impacts on health care institutions focused primarily upon the transportation needs of patients and others traveling to medical care facilities in the Bay Area. We sought to determine what transportation options and difficulties were perceived by individuals who needed to seek health care to or to visit someone in a hospital. We focused specifically upon how travel needs related to people's accessibility to a variety of medical care institutions, perhaps indirectly influencing the readiness with which people would seek medical attention or the quality of obtainable care. Were individuals dependent upon family and friends when they needed to get to health care? Had clientele characteristics or transportation-related patterns around medical facilities changed perceptibly since BART had been in operation? Finally, what were the institutions' own orientations to and expectations of BART?

Facility Access and Administrative Response

The case studies and client surveys of five medical care facilities produced a range of findings on the research issues in focus. Private facilities with predominantly middle- and upper-middle-income white clientele (e.g. Kaiser-Permanente, Walnut Creek and Alta Bates, Berkeley) revealed low levels of transportation dependence as measured by the survey, high levels of private automobile use, and extremely low levels of public transit

use including BART. Public facilities whose clientele included lower- and lower-middle income and ethnic minority individuals showed greater levels of expressed transportation dependency, lower levels of private automobile use, and higher levels of public transit use including BART. Local factors militating against private automobile use and a low income level of client groups (with lower income implying lower auto access) appeared to be of key importance, with the highest public transit use evident where both of these factors were present.

Interviews with health care administrators and staff also provided some data on the institutions' accessibility via BART and other public transit as well as their expectations of BART-related impacts; these were consistent with survey findings. Where problems of auto access make public transportation a more desirable option, as at Alta Bates and U. C. Medical Center, administrators looked to BART and other public transit as a means of alleviating neighborhood problems. For example, at U. C. Medical Center, where parking is scarce, administrators sought to encourage public transit use by their staff. However, even where administrators assumed low auto access among their clients, as at Herrick and Kaiser Oakland, the costs of providing feeder access from BART posed a primary obstacle.

In general, administrative decision makers predicted the continuing preeminence of the automobile as the chosen mode to health care, and concentrated their client-oriented transportation planning efforts on the provision of adequate parking. Administrators at facilities serving predominantly white, high-income clientele, where local factors were conducive to private automobile use, doubted that client usership would justify the expense involved in providing feeder systems from BART.

BART Impacts on Health Care Locational Decisions

BART influenced the decision of Kaiser Permanente to build its new Richmond out-patient facility close to the Richmond BART station. The location was chosen over two other Richmond sites, including a Hilltop development location close to Interstate-80. The Hilltop site is the present location of the only substantial commercial and residential development in Richmond. Choice of the downtown BART area site represents a departure from usual locational priorities of placing health services close to direct freeway access. Kaiser administrators indicate that improved access via BART for health care staff and transit-dependent patients were primary considerations in the decision.

The study of impacts on health care institutions is described more fully in Impacts of BART on Bay Area Health Care Institutions. (Minkus, Gelb, 1977).

IMPACTS OF BART ON LOCAL POLITICAL ACTIVITY

While development of the BART system did stimulate public controversy, in general it had little impact on local political activity. This was the case even in terminal station areas, where expectations for adverse BART-associated environmental impacts (such as traffic congestion) were greatest. The observations of our study are clearly supported by the results of the BIP Environment project's response survey findings (DeLeuw, Cather & Co., 1977). Interviews with persons living within four blocks of the system in ten residential areas showed that expressed opposition to the system most often took the form of talking

to neighbors, and even this mild form of political activity occurred at low levels, involving at most about one-third of the respondents. More formal public actions (voting for candidates on the basis of their position on BART, signing petitions, attending pro- or anti-BART meetings) occurred at much lower levels, involving fewer than 15% of the residents surveyed at all sites except Daly City, where 18% of the respondents reported signing petitions against BART.

A different kind of response stimulated by fears of development took place in two communities which were designated by planners as potential sites of intensive redevelopment related to BART station proximity. These were the Rockridge area in Oakland and the Mission District in San Francisco. In both cases, local political organizations developed successful campaigns which brought about city action to redefine zoning regulations, reflecting a desire by residents to preserve community character and discourage commercial development.

We have focused on the Rockridge Community Planning Council (RCPC) and the Coalition of Political Organizations (Mission) as the major sources of sustained community-level political activity which accompanied the development of BART. The factors behind this activity were: 1) the official "targeting" of the areas for development mentioned above and 2) the nature of the communities themselves. Rockridge is a community predominantly of white collar professionals, artists, and students who, although not customarily involved in community organizing, are articulate, aware of the workings of government, and capable of presenting a "case which demands consideration". The Mission District is the cultural and residential center of San Francisco's Spanish-speaking community, a predominantly working-class population with a growing awareness of itself as a distinctive cultural community.

Brief case histories of these organizations and their activities are presented here to help sensitize transit planners to the likely concerns of communities near the system and to demonstrate the need for community involvement in the planning process. They give evidence, as well, of the potential for local control over planning policy and actual development.

Rockridge

The model of political organization that Rockridge was to follow was developed in 1968 by one of its subcommunities for dealing with the Oakland Planning Committee. The Telegraph Avenue Neighborhood Group (TANG) created an organization of blocks with block captains, and neighborhood group representatives were established throughout the area. Leafletting brought residents to neighborhood workshops to assess and develop community opinion and finally to draw up a policy position. This was basically the strategy adopted by Rockridge around the BART-associated development issues, resulting in the emergence of the Rockridge Community Planning Council (RCPC) in 1970.

For the most part RCPC leadership consists of well-educated white professionals, often married couples in their thirties and early forties. While they come from all over the community, most live in the more affluent areas. Despite this selective dominance in leadership, the organization in its rezoning efforts, was able to draw a more representative cross-section of the community to neighborhood meetings. While older people attended the meetings, professionals under the age of forty were predominant in

the group. Thus, the community advocates were often the peers of the Oakland City Planning Department; they demanded respect as equals and were able to construct a plan of sufficient professionalism to reinforce that respect.

The RCPC developed a comprehensive land use plan for the Rockridge neighborhood which was eventually adopted by the City of Oakland. The distinctive feature of the plan was a de-zoning of the area to ensure preservation of the neighborhood's low-density residential character. Land use plans for the commercial area near the BART station were also developed. These plans placed strict zoning and development constraints on commercial and residential development for the area proximate to the BART Rockridge station. The Rockridge station is located at the intersection of College Avenue and Route 24. Commercial downzoning occurred along College Avenue for approximately ½ mile south of the station and 1/3 mile north of the station. Residential downzoning occurred in an area of approximately ½ of a square mile on both sides of College Avenue. The organization applied several lobbying techniques: teams of people went to see city councilmen, letters were photostated and sent to each councilman, and many residents prepared speeches for the meeting. RCPC also carried out an extensive letter-writing campaign.

Since its zoning struggle, RCPC has become a small organization of concerned professionals. It has the potential, as a large grass-roots organization, of activating on an issue of sufficient community interest. RCPC has not been able to muster any real push to alleviate its traffic problems or to create open space in the area, but these issues do not represent an outside force against which the community can rally. It remains to be seen whether RCPC will be able to effect further changes for the benefit of the community.

RCPC has been an influential model for other neighborhood lobbying groups in Oakland, such as the Piedmont Avenue Neighborhood Improvement League, the Fairview Park Neighborhood Association, the Bateman Neighborhood Association, and the Claremont-Elmwood Neighborhood Association. The concept of advocacy planning for neighborhoods has become more popular in the past few years and RCPC has set the pattern.

The Mission

A burgeoning of political organization in the Mission came in 1968 from a nucleus of activists involving former field workers for the Student Non-Violent Coordinating Committee (mostly participants in the voter registration drives of the mid-60's), students and intellectual/political cadres active in the highly politicized strike at San Francisco State, and Alinsky-trained community organizers.* While their backgrounds and training were highly divergent, they held a common commitment to heighten the political consciousness of the Mission residents and to organize a community base which could work toward eliminating the economic and political disadvantage of the Mission District. First, they organized around the real and immediate local problem of littering and using vacant lots as dumps. As the dumps were cleaned up, the group became recognized as an effective unit for community service.

*Sol Alinsky was a political organizer who gained wide public attention in the 1960s through his activities in the Chicago area, where he developed support for community movements around long-term social issues (e.g., unemployment) by using block organizing and focusing on short-term, pragmatic objectives (e.g., garbage collection).

Recognizing the church as the source of existent local leadership, organizers went to the churches and presented their program for block-by-block organizing around immediate local problems. A broken street light, tardy or infrequent garbage collection, an unpaved segment or a hole in the street were all matters upon which community service could generate further action.

These block clubs were organized to meet once a month, and they became part of a federation of blocks and organizations that developed into the centralized Mission Coalition. From the beginning, the Mission Coalition was headed by a political elite that wished to pull its constituency along. As new issues came before the group, this elite bifurcated, then splintered into a variety of committees and programs that took it along more and more technical routes. The Coalition thus developed committees on health, community maintenance, planning, recreation, culture, finance, and employment.

Once construction of the BART station at Mission and 24th was underway, the political struggle over nearby land use absorbed major attention from the Mission political organizing elite and interested committees. This struggle was to involve many local residents as participants in collective action for a full year.

The focus of community organizational activity was the zoning status of the area between Capp and Bartlett Streets, proximate to the Mission and 24th Street BART station. Since 1960, these two streets had been zoned for commercial development, although their existing use was primarily residential. Community organizers felt that if they could effect a rezoning of these streets to residential use, large-scale, double-lot commercial development of Mission Street would be prevented.

The Ad Hoc Committee to Rezone the Mission emerged in early 1974 and consisted of La Raza Centro Legal and the Mission Planning Council. La Raza Centro Legal consists of young law students and other pre-professionals with a strong ethnic identification and a political commitment rooted in the ideology of the early Mission activists. While the concern of the Centro Legal was to preserve the cultural and political base in furthering their drive for social and economic change, Mission Planning was concerned more about the preservation of the old victorian houses in the area. The latter group consisted mainly of white, middle-class sympathizers whose immediate interests coincided with those of the Spanish-speaking community. The common interest of the two groups was to halt commercial expansion into residential sections of the Mission. Their fear was that big businesses would move into the area, build high-rise office buildings and multi-unit apartment complexes, and drive up property values and rents.

The result of the political activity in the Mission was the downzoning of the area along Capp (one block east of Mission Street) and Mission Streets between 22nd and 26th Street and of Capp Street between 18th and 22nd Streets.

Because the Mission District was organizing behind the Centro Legal around issues of culture, education, and "consciousness," the political elite was able to draw support by celebrating the area's Spanish history and calling attention to the current cultural and social renaissance of the area. The fight which eventually gained rezoning for the area was symbolically a struggle over the fate of a place for the Latin people in San Francisco.

La Raza Centro Legal and the Mission Planning Council continue to be actively concerned about the development of public park space, a range of community services, and the economic and cultural well-being of the area.

Case Comparison

While the RCPC and the Mission Coalition are widely varied in their sources, objectives and means of operation, they are similar in their perceptions of the issue of local planning control and in the success of their campaigns against potential intensive local development.

The Rockridge organization emerged in response to the threat of BART-associated development. Resources were mobilized, and desired results were achieved. While the organization has continued to exist as an entity, it is virtually latent without the presence of a perceived threat to the community. When middle-class groups mobilize, they are likely to have a relatively large group of part-time activists, and they can rely more heavily upon the larger constituency to supply a fluctuating level of part-time activism and voluntary professional skill. Such political groups are likely to witness a convergence or leveling of the differences between internal elements. The dominant ideology forces the leadership to remain close to the constituency in both style and content of political expression.

The Mission La Raza is a previously existing advocate organization which focused intense effort on the campaign to prevent intensive development in the Mission neighborhoods near BART stations, mobilizing area residents around issues of economic and cultural survival. Since its successful rezoning campaign, it continues to function actively through its specialized committees and ideologically as a symbol of cultural and community strength. When working-class ethnic and minority communities organize, they are more likely to rely upon the proliferation of an elite, a relatively narrow base of part-time activism, and the potential crisis mobilization of the larger constituency.

The constriction of the middle level of activism means that there is less routine knowledge of the activities of leadership, who in turn engage in more interpretation of the will and interests of the constituency.

A theme common to the Mission and Rockridge activities studied here is a mistrust of the interests of the combination of BART and big developers. Key political actors in the communities under study extrapolated from their awareness of the official participation of chambers of commerce in highway planning to assume that BART's development sprang from a similar kind of coalition planning. BART is not seen as an isolated development by these political actors. Rather, whether they are correct or incorrect, they see BART as a manifestation of a larger complex.

This perceived complex is a coalition of federal authorities, city politicians, large corporations, powerful real estate interests, and the construction trades. In every major city, this coalition has pushed for urban renewal, redevelopment of the central business district, and the redevelopment of local business centers or "malls." The interests of this coalition are at least citywide and in some cases regional and national. The critical point is that they are not local in a lack of concern for the continuity or integrity of the neighborhood that might be transformed by "development" or "renewal" or "modernization." At the federal level, the interest is to encourage cities to stimulate investments and to provide a system of transportation. For big business and chain stores, the interest is in taking advantage of land write-downs and tax incentives, and in shaping a transportation system that brings in as many consumers as possible. Where highways and other transportation networks are placed is seen to be the prerogative of this political and commercial coalition.

It is most interesting that among all the BART stations, it was the potential loss of local control to the "big interests" which stimulated sustained and effective political activity. The changes in environmental quality resulting from the presence of the system (e.g., added noise from passing trains, the visual intrusion of a BART station, and increased traffic near the station) may be the cause of personal inconveniences and adjustments, but they were evidently not perceived as a sufficient threat to neighborhood character or way of life to warrant sustained political action.

Detailed accounts of the Rockridge and Mission case studies of political activity can be found in Impacts of BART on Bay Area Political Institutions (Duster, 1977).

INTRODUCTION

An assessment of BART's social impacts on three representative communities within the BART service area was undertaken as part of the BART Impact Program Policy Oriented Case Studies. These program-wide case studies are designed to provide a comprehensive assessment of the social, economic, land use, environmental, and transportation system impacts of BART within different types of communities within the BART service area. The three communities selected for study by the Institutions and Life Styles Project represent settings with different types of residential and commercial uses and populations with varying socioeconomic characteristics and are a sub-set of the seven program-wide case study areas.

The three communities of Walnut Creek, Richmond, and downtown Oakland represent three different types of community settings along the BART line. Walnut Creek is a small suburban community near the eastern end of the Concord BART line. Richmond, the terminal location of the Richmond BART line, is an urbanized industrial and residential community on the urban periphery of the East Bay. Downtown Oakland is a commercial and residential urban core community which stands at the hub of the BART system; examination of BART's impact upon these divergent types of community settings, along with an examination of differing community attitudes toward BART within these settings, provides insight into the present and potential meaning of BART for Bay Area institutions and life styles.

Within Walnut Creek, approximately one household out of ten includes a regular user of the BART system. Most persons from Walnut Creek commute to work places in San Francisco or Oakland, and BART captures a substantial share of the work commute travel from Walnut Creek. Walnut Creek has been a desirable suburban residential community since its founding about fifty years ago. It is located near the intersection of the Interstate 680 and Highway 24 freeways, and with the addition of BART, the community's appeal as a bedroom community for white collar workers in the urban core has been enhanced.

It was expected that BART might have the effect of encouraging more clustered, multi-unit residential development within walking distance of the Walnut Creek station. However, with the exception of substantial apartment development activity around the Walnut Creek station during 1971, there has been no substantial increase in the demand for or, as reflected by zoning restrictions, the apparent desirability of multi-family apartment residences near the BART station. Nevertheless, during the last ten years, development in the area surrounding the Walnut Creek station represents 37% of all commercial development in Walnut Creek, in comparison with a 5% share in the same area during the preceding decade (Dyett, 1977). Thus it would appear that BART has helped to stimulate commercial development in Walnut Creek. Still, the research findings which follow will confirm the fact that BART has had very limited impact upon the stimulation of new sub-regional retail sales or services and related employment development.

Richmond is primarily an industrial city with a limited transit network provided by AC Transit. The city's main industrial employers, among which Standard Oil and Safeway are the largest, and its assorted industrial and warehousing enterprises are accessed primarily by automobile. Present ridership at the Richmond station is relatively low. This reflects the limited employment of Richmond residents in downtown Oakland and San Francisco work locations best served by BART. Also, the present requirement to transfer to a Daly City line for West Bay locations appears to discourage greater patronage of the Richmond station among potential transbay travelers.

The Richmond BART station was deliberately located in a downtown redevelopment area with little commercial and residential development in the hope that it would add impetus to the area's growth. At present, however, there has been only limited development of the land around the BART station, and research findings indicate that BART has not substantially increased the desirability of development there. Overall, BART has not had a noticeable effect on the organization of life styles and institutions in this community with dispersed residential and industrial development, relatively high automobile dependence, and limited bus and feeder connections between BART and the major employment and retail centers.

BART stations in downtown Oakland are located at the center of the older downtown Oakland retail and city services area and at the edge of the newer downtown area to the northeast. Commercial, residential, and retail developments estimated to cost over \$500 million are planned for construction within one mile of the two downtown Oakland BART stations and the nearby Lake Merritt BART station. The planned and partially developed City Center project near the 12th Street BART station represents a concerted effort by the City and the Oakland Redevelopment Agency to revitalize the downtown Oakland core area; BART was promoted as part of this revitalization process.

Downtown Oakland provides a case setting for assessing the meaning of BART in the growth process of an urban core area where commercial and retail redevelopment is a primary civic and private business objective. At the same time, because downtown Oakland is also an area with a concentrated resident population of elderly persons with low incomes, it provides an ideal case setting for identifying present and potential impacts of a new rail transit system on the travel options of the transportation-disadvantaged elderly. The case study materials which follow make clear the limits of BART impact on the downtown Oakland area and its population, but they also suggest that the retail and business community believe in the imagery and symbol of BART as signs of potential for growth of the retail and commercial development within the core area of Oakland.

DOWNTOWN OAKLAND

The central urban core of Oakland is an area with mixed commercial and residential land uses. The focus of activity is the City Center area on Broadway between 12th and 14th Streets, where the BART 12th Street station is located. This is the site of the City Center redevelopment project, of which the new Clorox and Wells Fargo office buildings are part. The redevelopment project will encompass 16 blocks when complete. City and county government offices and department and specialty stores also exist in the area. Additional redevelopment and restoration of Chinatown and Victorian structures is planned in this area to the south of City Center, where an atmosphere of bars and pawn shops currently prevails.

The 19th Street BART station area is within a newer downtown center. The buildings in this area provide space for offices, department stores and smaller shops, banks and restaurants. The Paramount Theater is located in the area, and the Kaiser Center is two blocks to the east, along the shore of Lake Merritt. The Lake Merritt BART station to the east is proximate to Laney Community College, the Alameda County Courthouse, the Oakland Auditorium and the Oakland Museum as well as a variety of city and county offices.

Case Study Focus

The downtown Oakland BART stations are primarily of interest as destinations of employment trips and shopping trips by travelers from the suburban and urban periphery. In addition to studying these issues, our case study of downtown Oakland focuses on the substantial downtown Oakland elderly population and their transportation needs.

Merchants' Perceptions of BART Impacts*

Twenty percent (20%) of 66 downtown Oakland merchants surveyed report that BART has caused an increase in their volume of business. They attribute increased sales to the increased foot traffic from BART stations (mainly commuters and tourists). Most of those merchants not in areas where foot traffic has increased see no impact on their sales volumes, except that merchandisers of specialized products not commonly available, such as specialized clothing and footwear for middle aged and elderly adults, report that BART helps draw business from throughout the region. Other merchants believe that BART helps to make downtown Oakland more attractive as a retail sales area, but that it does not improve their particular businesses. Two-thirds of the merchants report that BART helps to improve business in the downtown area as a whole.

BART appears to encourage a shift toward more racially integrated patronage in downtown Oakland stores. One store estimated that because of an increase in non-black customers coming from BART, the proportion of black shoppers has dropped from 90% to 60%. Other merchants volunteered a perception that BART increased the flow of whites into the downtown shopping area by providing commuter access to new downtown work locations. Merchants report that present Saturday patronage at their stores is primarily black and suggest that Saturday BART service may similarly bring more white patronage.

As reported by some merchants, Saturday business in Oakland is slow, and Saturday BART service will not help because downtown Oakland is primarily a destination for weekday workers, not a shopping destination for weekend shoppers. However, a large majority of downtown merchants believe that Saturday BART service will improve Saturday sales volumes. About 30% of the merchants feel that BART encourages suburban residents to shop in downtown Oakland, while 25% expressed the view that BART shifts local and

*As noted, these are the perceptions of a number of merchants who were interviewed. A broader and more systematic analysis of retail sales data is being done in the Land Use & Urban Development Project, the results of which will be available late in 1978.

suburban trade away from Oakland into San Francisco, because Oakland is unable to compete with the glamour and variety of stores that San Francisco has to offer. It was frequently argued that BART neither helps nor hinders business in downtown Oakland, because the problem is with Oakland's image, and that considerable upgrading of the facilities and imagery of Oakland is necessary before BART will have an impact.

Burke Market Research conducted a study of potential demand for shopping facilities at City Center which confirms the view that downtown Oakland does not currently have enough variety and concentration of stores to attract numbers of shoppers. Of a sample of 311 female heads of households in residential urban areas near downtown Oakland, over 50% find the present Oakland shopping district sufficiently attractive or convenient to have shopped there during the last three months, while 85% indicate that they would shop at the City Center Project when development is completed. (Clothes Shopping Study, Burke Marketing Research, June 1977.) The planned variety of stores in one centralized location was cited as an important factor to 60% of the respondents, while 32% cited parking facilities and 10% cited convenience to public transit as primary considerations in their decision to shop in Downtown Oakland.

Perceptions of BART's impacts appear to vary by business location: the merchants closest to BART stations are those most likely to express a positive perception of BART's impacts. The most positive reports of BART impacts upon specific businesses and upon the downtown as a whole are concentrated in the 19th Street station area. Merchants near the 12th Street station area who have borne the brunt of the combined BART construction and redevelopment activity, were generally more pessimistic in their images of BART's impacts, expressing bitterness and disappointment in BART and the redevelopment project for not enhancing the quality of the downtown shopping area. With the demolition of older buildings and the dispersion of retail businesses, the 12th Street area has become a partial void which is seen by merchants as discouraging retail foot traffic and customers from outside the region.

About 75% of the merchants believe that BART will have long-run positive impacts upon retail business in the downtown Oakland area, but only when the City Center Project, new freeway access (via the Grove Shafter extension from Highway 17), and related improvements are completed. Considering long delays in approval for the Grove Shafter freeway extension and the lengthy processes of redevelopment and BART construction, expressions of negative feelings and resentment about the revitalization of Oakland are less surprising than the remarkable faith that BART and the City Center redevelopment will contribute to the future vitality of retail business in downtown Oakland.

Use of BART by Commuters to Downtown Oakland

Because of greater ease, shorter travel time or lower cost, BART is used for the journey to work by some of the employees at most of the downtown Oakland retail businesses, according to merchants interviewed. In addition, about 25% of the merchants report that BART is used by a relatively large number of employees, and 10% report that BART makes employment possible for some workers without car access.

BART appears to be highly utilized by downtown commuters to the Clorox and Wells Fargo office buildings in the City Center Project. (Task 4, Economic and Finance Project, BART Impact Program, notes, 1977.) Clorox estimates that about 50% of its workforce uses

BART regularly for the commute to work; similar estimates of BART use among employees are made by other corporations in the area. However, no employers report making special adjustments (such as more liberal time policies or flex-time). BART is viewed by corporate officials as a minor enhancement in the recruitment of employees, making possible a wider range of recruitment especially for clerical and other non-professional employees.

Views of Redevelopment Planners

City of Oakland redevelopment officials perceive that BART has enhanced downtown redevelopment by providing community development credits as matching funds for Federal funding of the Oakland redevelopment project. Key informant interviews also reveal that BART is perceived among planners as a "convenient marketing device" for acquiring City Center tenants such as Wells Fargo, Clorox, and the Federal Energy Resources Development Administration. Although planning officials acknowledge BART's influence, they are hesitant to place an economic or social value on this influence.

Views of the Corporate Business Community

While improved accessibility is recognized as essential to the vitality of downtown Oakland offices and retail facilities, the presence of BART is viewed as relatively unimportant in comparison to the role of the new freeway access. The Grove-Shafter extension is seen as the primary factor for successful downtown retail development. Business persons responsible for the planning and development of the Oakland City Center project see BART as a relatively small influence encouraging the location of businesses in downtown Oakland. To date no businesses from outside the region have chosen to locate in the Oakland City Center because of BART's presence. Nonetheless, as a new and technologically advanced system BART appears to create a new image of public transit among corporate decision-makers. Further, as perceived by one corporate executive, BART facilitates an emerging identification of Oakland as a hub of East Bay business activity.

Impacts on Residents of Downtown Oakland

The population of downtown Oakland is distinguished from that of the three-county BART service area by advanced age, limited mobility, limited income, and the lower levels of automobile access typical among the elderly poor. Of all BART stations, the two downtown Oakland stations have the largest percentage of elderly persons entering the BART system. Passenger Profile Survey Data show that 10% of those entering the system from 12th Street station and 14% of those entering from the 19th Street station are over 65; systemwide, an average of 5% of the riders are 65 or over.

Oakland's population of persons over 60 years old constitutes almost half (47%) of Alameda County's elderly population and one-third (34%) of the County's elderly poor (Oakland Task Force on Aging, 1975). Elderly residents comprise 30% of the population within one-half mile of BART's 12th Street and 19th Street stations. A population of elderly citizens living on low or restricted incomes live in the area around the 19th Street BART station in residence hotel apartments; within some census tracts, over one-third of the elderly residents are below poverty level.

Information on the elderly population of downtown Oakland and their transportation needs in relation to BART was gathered through group key informant interviews with the elderly population and individual key informant interviews with social service personnel, who specialize in the planning and delivery of social services to the downtown elderly population. The group discussions were held at three Senior Activity Meetings in the area. These are regularly scheduled weekly gatherings held under the sponsorship of the Social Service Bureau of the East Bay.

Reason for BART Non-Use by the Elderly

While persons 65 and older make up about 12% of the BART service area population, with concentrations of elderly located at some points close to the BART line, not quite 5% of all BART riders are elderly. This is somewhat surprising, especially in light of BART discount tickets, sold at banks, which provide a 90% discount for persons over 65. The interviews suggest three major reasons for BART non-use among the elderly, somewhat paralleling the reasons for non-use among members of ethnic minorities and persons with low incomes.

BART does not go where they want to go. Most travel by Oakland's elderly is reported to be to points close to home, and trips are usually made by foot, bus, or car, if available. BART is not generally competitive with the AC Transit bus system for short trips in the area.

BART is unfamiliar. Elderly persons know the bus, its routes and schedules, while BART is not part of their world of experience. Because of needs for autonomy and independence, the elderly traveler unfamiliar with BART is likely to find it awkward and strange. Therefore BART is not perceived as an alternative mode for trips which it might effectively serve. The Social Service Bureau of the East Bay provides system orientation services; through such programs and by introduction through friends, non-use of BART because of unfamiliarity may decrease.

Access to and from the BART stations is a problem. Many persons commented that it was not practical to use BART because they had to walk too far or were not familiar with bus connections to or from BART. Difficulties of movement in and out of the stations were also expressed as concerns, related especially to the escalators ("Why do they always seem to go down when it is harder to walk up?") and the elevators ("Who can use them?" "How do they work?"). These concerns strongly articulated at all Senior Activity Meetings, reflected more concern about distances to or from BART or about unavailability of feeder service than about particular characteristics of BART trains or the station environment.

BART Use by the Elderly

Elderly users reported that BART made possible new and more frequent shopping trips and non-specific outings to downtown San Francisco and suburban shopping locations (especially Bay Fair and El Cerrito Plaza). Other trip purposes reported included travel to visit friends and relatives. Among the Oakland Chinese senior citizens there were reports of BART use for travel to San Francisco Chinatown to visit friends and relatives, to shop, or to attend associational banquets, supporting an earlier hypothesis that BART would increase the sense of connection between East Bay and West Bay ethnic communities.

Among a majority of BART users at the Senior Activity Meetings, responses to BART were generally positive. Elderly users reported that they liked BART, its comfort, and the clean atmosphere on the cars. They also commented that BART is more comfortable and has a better class of patrons than the bus and that they generally feel more secure on BART than on the bus. However, respondents who had ridden BART at night reported that because of empty stations they felt BART was not safe; there would be no one to help them in case of mugging or harrassment. Aside from nighttime travel, BART appears to improve the experience of public travel for the elderly who use it and to increase travel to certain limited locations.

WALNUT CREEK

The City of Walnut Creek lies on the rolling plain and small foothills at the base of Mt. Diablo in western Contra Costa County. It is a small, growing bedroom community with a well developed subregional downtown center where newer stores have been added to the older downtown district, which was originally developed in the 1920's. Walnut Creek is an expression of a 20th century American dream: a suburban world of middle-class workers' homes removed from the distasteful elements of the cities in which they are employed. Of the city's total work force, only 20% work locally, with 50% commuting to San Francisco or Oakland and the remaining 30% commuting to other cities in the area. (Peat Marwick Mitchell & Co., 1977).

Located on the edge of Interstate 680 near the intersection of the Route 24 Freeway into Oakland and San Francisco, Walnut Creek is an example of the growing, automobile-oriented, suburban life style that began to develop along with the development of the high-quality freeway system throughout the state during the 1950's. BART represents a new transportation alternative to this area where auto availability is high and where previous public transit was limited to mainly peak hour Greyhound service.

The Walnut Creek BART catchment area, if defined as the area within a three-mile radius of the station, contained 48,200 persons, representing a mean income of \$15,000, in 1970 (Peat Marwick Mitchell & Co., April 1977). With a typical daily station patronage of around 3,600, BART apparently impacts upon the daily routines of more than 10% of the households in the catchment area.

BART Passenger Profile Survey data (1976) suggest that the only notable differences in trip purposes among travelers from Walnut Creek when compared with travelers system-wide is the greater proportion of work travelers (65% vs. 52% systemwide). Of greater interest is the age distribution of Walnut Creek BART travelers. Walnut Creek is the suburban location with the largest percentage of entering travelers under the age of 18 (7% compared to a system-wide average of 2%) and over the age of 65 (9% compared to a system-wide average of 5%). It might be expected that BART's impacts upon Walnut Creek users would fall mainly on these two sub-populations and upon the sub-population of regular commuters.

Case Study Focus

A description of the Walnut Creek shuttle bus service and its use is presented below. Most of the remainder of the case study focuses on the main sub-populations of interest in

Walnut Creek through interviews with key informants and with elderly users at the Rossmoor community, with younger workers at the Diablo Keys apartment complex, and with youth at the Walnut Creek BART station. Finally, a brief look is taken at BART's effects on Walnut Creek businesses.

Walnut Creek Shuttle Bus Service

One direct impact of BART was the initiation of a Walnut Creek downtown BART shuttle bus service. The service was originally established in 1974 and went from the BART station to the downtown shopping area, with parking facilities on the perimeter. Bus headways were 10-15 minutes, with service hours from 8:30 a.m. to 6:00 p.m. Forty percent of the costs were paid by a tax on downtown businesses, licenses, and voluntary contributions from institutions like Kaiser-Permanente Hospital, banks, insurance companies, and title companies. The remaining operational costs were met with city funds. In the fall of 1975, service was extended along two other routes serving Walnut Creek residential areas, with service hours from 6:00 a.m. to 7:30 p.m. These extensions were made primarily in response to pressure from residents and because of observations that the BART parking lot was usually filled.

The shuttles are used most during peak periods, because of the continuing overflow parking problem at the Walnut Creek BART station, and the use of the bus feeders is on the rise. Total daily bus access to BART may be estimated at around 580 persons, or 15% of the ridership from the Walnut Creek station (BART PPS, 1976).

Short contact interviews with daytime riders of the shuttle indicate that the midday shuttle service is important to the travel options of persons with limited car access, primarily older persons and youth, for midday travel into downtown Walnut Creek. The shuttle provides a new transportation option for outings with friends, visiting, or shopping in downtown Walnut Creek.

For reasons of flexibility and shorter travel times, the automobile is the preferred mode of BART station access for those in Walnut Creek with automobiles available. However, due to limited parking at the Walnut Creek station, even car owners may choose to use the shuttle. While car dominance can be expected to continue, the Walnut Creek case indicates that where there is demand for commuter rail service and parking is constrained, there will be a rising demand for local bus access to the station.

Rossmoor

Rossmoor was chosen for study because of the concentrated population of residents over age 55 in a community setting with its own feeder service to BART. Preliminary field observations revealed that a large segment of the persons over 65 entering the Walnut Creek station were coming from Rossmoor. The community was studied through key informant interviews with the owners, developers, and operators. In addition, interviews were conducted with residential key informants who are regular BART users. Rossmoor is an "adult community" within Walnut Creek, located about five miles from the Walnut Creek BART station. Most of its residents are retired from full-time employment, and most are in the upper- and upper-middle income brackets and social strata. In recent years, an increasing portion of the residents have come to Rossmoor at a younger age,

while still fully employed. (The minimum age requirement for residency was recently lowered from 52 to 45 years.) At present, at least one person in 25% to 35% of the households is fully employed.

The community is located on the property of the former 2,200 acre Dollar Steamship family cattle ranch. In 1963, the land was sold to the Rossmoor Corporation for development of a senior citizens' community. Although not contiguous with the existing city limits, the property was annexed to the City of Walnut Creek and zoned for 11,000 dwelling units. The development currently has about 8,000 residents.

Factors of community social life and the sense of security provided appear to be most important in the choice of Rossmoor residency. Older residents feel they will not become lost in isolation and loneliness, and residents feel protected from burglaries and other intrusions and have the assurance of service and transportation in emergencies. The factor of BART access appears to have less importance in residents' decisions to move to Rossmoor, although the feeder bus service, now coupled with advertised access to the BART system, is seen by informants to be an important selling point for the Rossmoor Development.

The feeder service between Rossmoor and the Walnut Creek downtown and BART station currently provides headways of 45 minutes throughout the day. The service operates at a loss to provide travel for community residents who are unable to drive or prefer not to drive. The service includes two commuter buses early in the morning with direct service to the BART station. On a typical day in May 1976, the Walnut Creek service carried about 150 passengers a day, about half of whom employed the feeder for access to BART.

Among regular Rossmoor BART users, the majority use BART primarily for the work commute. Unemployed residents use BART occasionally for non-specific recreational activities, shopping, and cultural activities in downtown San Francisco and Oakland. Others make health care trips via BART, in some cases to health care facilities in their former residential neighborhoods. In combination with the feeder service provided, BART represents an important facet in the potential mobility of Rossmoor residents. For senior citizens operating on a relatively open schedule, BART is perceived as a very pleasant means of access to downtown San Francisco and Oakland.

The non-commuters interviewed at Rossmoor were generally very positive about BART. While criticisms were offered of BART's operations, residents are appreciative of its comfort and relative social tranquility in comparison to the bus. Commuters were more ambivalent, seeing BART as the best of present alternatives, but bothered by its delays and unpredictable travel times.

Diablo Keys

Diablo Keys is an apartment complex development of the Systech Corporation, a subsidiary of the Dillingham Corporation. Built in 1971, it was able to take advantage of the original BART-related zoning plan in Walnut Creek, which lowered the off-street parking requirement for multi-unit development near the BART station. It represents an equivalent to the Rossmoor development for the younger, single person. It was designed as a total community environment, where residents have the privacy and freedom of their own rented apartments but may participate in a range of social activities. Its facilities

include a swimming pool, racquet ball courts and saunas, and it features activities such as movies and special excursion events. Security is an important feature of its appeal: all visitors are screened at an entry point to gain admittance. The facility is designed for adults only, with no regular residents under the age of 16.

Resident key informants state that most residents of Diablo Keys use cars for most of their travel needs, as do most suburban residents. However, one key informant estimated that one-third to one-half of the Diablo Keys residents commute primarily by BART to San Francisco and Oakland. The development is located about a half mile from the Walnut Creek BART station and provides an advertised shuttle service to BART. Before overflow parking at the Walnut Creek station was a major problem, most residents walked to BART or used their own cars, with relatively few persons using the shuttle. Recently, however, parking places in the BART lot are taken by 7:00 a.m. and shuttle ridership has increased accordingly.

Because of the many unique features of the development, it is difficult to estimate the influence of BART access on resident decisions to live at Diablo Keys. The area of most certain BART impact upon the desirability of Diablo Keys is for temporary residents of the apartment complex. A section of "executive apartments" is maintained for persons on temporary business in the area, offering a vacation-like environment while providing ready access to San Francisco and Oakland via the shuttle and BART. For temporary residents, BART access provides easy orientation to an unfamiliar area and opens the option of the Diablo Keys life style.

Youth Ridership of BART in Walnut Creek

Riders under the age of 18 from the Walnut Creek station account for 7% of all Walnut Creek BART users, according to the BART Passenger Profile Survey (1976), while the systemwide average of young riders is only 2%.* Youth intercept interviews conducted at the Walnut Creek BART station suggest that BART is a routine facet of travel for youth in Walnut Creek. Most youths reported that other family members use BART, with one-third reporting that either their mothers or fathers commute regularly on BART. This suggests a process of family reinforcement which encourages BART use.

As revealed by Walnut Creek youth interviews, BART is used most often for school and work trips (24% each purpose), with substantial BART use reported for attending lessons, visiting with friends, and visiting with separated relatives (12% each purpose). Use of BART for recreation, medical visits, shopping or miscellaneous purposes is less frequent.

Parents are generally supportive of BART use by youth, in many cases because of personal familiarity with the system, and because they consider it socially safe.

*This may be an underrepresentation because the PPS was not conducted during the youth peak travel hours of 2:00 p.m. to 4:00 p.m., and it made no effort to record BART ridership by youth under the age of 14.

In accommodating some of the needs of youth, BART impacts on the family as an institution. BART enhances the freedom of Walnut Creek youth while freeing the parents from chauffeuring. In addition, BART appears to play an important role in maintaining family interaction among segmented family units by increasing the ease and frequency of visits by youth to separated parents.

Over one-third of the respondents reported using BART to explore in San Francisco, to go to the Coliseum, to go to youth hangouts in Berkeley, to parks or to rock concerts. In this respect, the Walnut Creek youth reflect a pattern of BART use by suburban youth for exploration and investigation of their environment.

Effects on Walnut Creek Business

Open-ended interviews were conducted with merchants in the Walnut Creek downtown retail business district. One-fifth of the respondents believe that BART brings new shoppers to their retail businesses from San Francisco and Oakland because people prefer the safer, newer shopping facilities in Walnut Creek. Most stores reporting new business resulting from BART access estimate that their new clientele is mainly middle-aged and older. While the majority of businesses saw no specific positive effect of BART on business volume, many felt that BART helps Walnut Creek business indirectly by making Walnut Creek a more desirable community in which to live.

Among merchants who believe that BART does not improve business in Walnut Creek, most concluded that BART takes business into San Francisco more than it brings business to Walnut Creek, reflecting the limited size and glamour of the Walnut Creek shopping facilities as an attraction for people from outside the area. This opinion is supported by the data gathered by the 1976 Passenger Profile Survey; for an estimated 38 shoppers going to Walnut Creek via BART, an estimated 93 go from Walnut Creek on BART to shop at another location. These numbers tend to confirm a view that BART is mainly peripheral to the main car-oriented shopping activity in Walnut Creek.

BART's impact on store employee travel in Walnut Creek appears to be very small as well, because most employees are local residents. One store reported that BART expands their range for employee recruitment, and some businesses use BART to move employees from store to store according to changing short-term employee requirements.

RICHMOND

Richmond is an urban industrial and residential city located on the peninsula separating San Francisco and San Pablo Bays at the southwestern edge of Contra Costa County. Richmond is important as the home of the Standard Chevron oil refinery (built in 1901) because it offers a setting with excellent access to both the San Francisco and San Pablo Bays. The development of Richmond's economy has been dependent on the refinery, the shipping and shipbuilding industry, and other warehousing and industrial activities related to Richmond's port access and the Santa Fe and Southern Pacific rail lines which diagonally traverse the city.

Richmond's population is estimated at 86,000 people. It has a large ethnic minority population, with the black population representing 51% of the city's residents and the

Spanish-heritage population accounting for 10% of its residents. Income is in the low-middle region, with 1970 mean income at \$10,363 and median income at \$8,600. Nevertheless, the level of auto ownership is relatively high, in excess of 67% of the adult population (1970 Census).

Richmond provides a case study situation for explaining the constraints on the scope of rail rapid transit impacts in an automobile-oriented, dispersed, industrial and residential setting. BART appears to be relatively unimportant to the social life of the Richmond community. Present BART ridership from the Richmond station is relatively low, with a daily patronage of 1,500 trips a day in comparison with 3,600 trips a day from Walnut Creek (a city three-fifths the size of Richmond). Little interest developed in Richmond among business or residential communities around plans for the BART station and related development. Further, BART has had little impact upon the commuting work force at the three main employment locations in Richmond: Chevron (3,800 employees), Safeway Distribution Center (1,800 employees), and the Social Security Administration (2,000 employees). The factor of ample parking availability combines with a lack of feeder service between BART and the main industrial employment locations to reinforce automobile use among Richmond employees.

BART Passenger Profile Survey data (1976) shows a high percentage of females among riders from the Richmond BART station, with 59 females to 41 males, compared to a systemwide ratio of 48 females to 52 males. Youths under the age of 18 constitute 6% of the ridership from the Richmond station, in contrast to a systemwide proportion of 2%.

Case Study Focus

Through intercept interviews in the Richmond BART station, this case study focuses on the characteristics of BART use among black females and among youth. Through key informant interviews with community leaders, representatives of social service agencies, redevelopment personnel, and personnel managers of prominent employment settings in Richmond, BART's relationship to the Richmond community and the reasons for ethnic minority non-use of BART are explored.

Black Female Ridership from Richmond

Black female ridership represents 19% of the total Richmond BART ridership, while systemwide black female ridership is only 7% of total ridership. In order to uncover an explanation of the relatively high percentage of black females in a setting where system ridership is relatively low, intercept interviews were conducted with black female BART users at the Richmond BART station during the hours from 7:00 to 10:00 a.m.

A vast majority of those interviewed (15 out of 17) were using BART for the work commute*, and about half report using BART for work purposes only. Most (60%) do not ride BART at night, with many choosing not to use it for security reasons. There is some use of BART for shopping or errands in connection with the work trip, but fewer special shopping trips. Half of those interviewed were traveling to white collar work locations in

*This is supported by the Passenger Profile Survey: 58% of the daytime black female travelers from Richmond use BART to commute to work; 30% of black female travelers from Richmond use BART to go to school.

East Bay central business district (CBD) locations (Oakland and Berkeley), while only about one-sixth were bound for the San Francisco CBD. About one-fifth of the respondents report coming from one-car families where BART improves or potentially improves the mobility of family members left at home.

Respondents expressed ambivalence about the uncertainty, slowness, and unreliability of BART service, but they choose to use BART because of relative convenience in terms of cost and time considerations for travel to work in central city locations. BART is generally viewed as more attractive and comfortable than the bus and less expensive than the car. Particularly for commuters to Oakland and Berkeley, BART access can be quicker than access by bus or car. Richmond commuters to San Francisco are somewhat less satisfied with transbay service because of the need to transfer. For trips to San Francisco, BART is not competitive in time and cost with AC transbay express service.

BART Use by Richmond Youth

Use of BART by youth in Richmond is relatively high. However, BART use tends to be less exploratory, more trip-specific, and more cautious than use by white suburban youth (cf. Walnut Creek case study, see also page 87, chapter III of this report.) Of ten youths interviewed, five use BART for visiting family or extended family members; one reports using BART for school trips. As in Walnut Creek, patterns of family use appeared, confirming the pattern of family reinforcement for youthful BART use among BART-using families. This is particularly interesting in an area where BART use by the population at large is relatively low.

BART's Relationship to the Richmond Community

While BART is useful and attractive for those with central East Bay employment locations, non-use of BART among Richmond workers is high. Interviews with community key informants shed light on the reasons for this non-use.

The executive director of an employment service for Spanish-speaking communities felt that there were both accessibility and cultural factors which account for the relatively low levels of BART use among his client population. Many clients speak Spanish only; for these persons, BART can be used only after developing a sense of direction and knowledge of the system through trial and error. The director of the United Council of Spanish-Speaking Organizations supported this perception, adding that the unavailability of bilingual information and the automated characteristics of BART tend to discourage BART use among his clients unless they are taught how the system works.

A community leader in the San Pablo and Parchester Village areas of Richmond (black communities in North Richmond) expressed the feeling that the BART information system is geared to the needs of the educated person rather than the uneducated because its use involves following written instructions. Further, he states that the community knows little about BART and that feeders from the community to BART are infrequent and too expensive for regular use. Because of transfers and layovers, the system does not encourage unemployed members of the community to seek employment in San Francisco. Yet, he feels that BART will eventually have a positive impact upon the community by stimulating community development.

Community informants also point out that BART does not serve main Richmond employment locations for working people. According to one community service person, for most job locations in Richmond, BART is of little use; without new feeder links, BART cannot serve most workers in Richmond. This opinion was confirmed by the personnel officer at the Safeway Distribution Center, who stated that only about ten of their 1,800 employees use public transportation, and a job developer for minority residents of Richmond, who said that most of his transit-dependent clients find the bus more convenient than BART for work trips.

The desire for direct service to San Francisco and the sense of inequity in the denial of this service to Richmond was an area of agreement among social service organizations and Richmond business representatives. Both groups felt that BART's potential for impact upon the availability of opportunities and services in Richmond would be enhanced by direct San Francisco service. When direct service is initiated to Richmond in the spring of 1978, it is likely that there will be some increase in BART use by work commuters.

BART Impact on Downtown Richmond Development

Richmond's BART station was sited in the center of the Richmond Redevelopment Project area because it was believed that BART would help to stimulate development of a mixed commercial-retail and residential area. Over a period of time, however, it became clear that the expectations for intensive commercial development around the station were unrealistically optimistic. Little interest has been generated in the undeveloped land parcels. The redevelopment area close to BART is now conceived as a service center, with the major development consisting of the Social Security Program Center and the Kaiser Medical Center (the latter yet to be constructed). However, until substantial change occurs in the consumer demand for BART, substantial commercial, retail, and residential development related to BART seems unlikely.

The most promising station-area development is a planned multi-modal transportation center, which will include space for AC Transit, Traveler's Transit (to San Rafael), Greyhound, and an Amtrak station (now in service) which connects directly with BART. With its initiation of direct San Francisco service, BART's appeal for the Richmond community might be notably enhanced by improved feeder headways and the coordination of feeders with BART through the multi-modal center.

Summary and Conclusions

In downtown Oakland, BART's most tangible effect has been its utilization by the city to gain matching federal funds for the development of the City Center Project. In a more subtle way, BART is important to the downtown revitalization because it provides unparalleled direct access to downtown Oakland from all areas served by BART. However, there is widespread recognition that the upgrading of Oakland's image as a commercial and business center is necessary before the link provided by BART will have a substantial effect, and the planned Grove-Shafter Freeway extension is considered to be more important than is BART to stimulation of the area's business activity.

BART stations in downtown Oakland have not attracted large numbers of users from among the elderly, low-income population concentrated in the area, in spite of the high level of transit dependence among this population. This is related to the travel patterns

of the elderly, who tend to make short, local trips which are served more effectively by AC Transit buses. Simple unfamiliarity with BART combined with difficulties of station access (especially among the mobility-limited) appear to preclude BART use for trips which it might effectively serve.

Of the areas studied, Walnut Creek has made the most systematic response to the presence of BART by initiating a limited shuttle bus service to the BART station and downtown Walnut Creek from the community's outlying residential areas. The developments of Rossmore and Diablo Keys provide additional private feeders to BART for their residents. BART's effects on retail business and commercial development in the area appear to be minimal, although Walnut Creek merchants recognize that BART has had an indirect, beneficial effect on business by making Walnut Creek a more desirable place in which to live.

BART ridership from Walnut Creek is at a high level, with work trips being its predominant use, and BART is more in the consciousness of the Walnut Creek residents as a travel option than it is for either downtown Oakland or Richmond residents. This is the case for the elderly and the youth of Walnut Creek as well as for the large work force commuting to the central urban areas. While the effect of BART's presence on decisions to reside in Walnut Creek is not clear, BART access is used by developers as a selling point to attract tenants.

To date, of the three areas studied, Richmond is clearly the least affected by the presence of the BART system. Low levels of ridership from the Richmond station can be expected to change only when feeder service to the main industrial and outlying residential areas of the community becomes adequate. With development of the planned multi-modal transportation center and initiation of direct transbay BART service, station-area activity and new development might also be expected to increase.

In all of the areas studied, BART's impacts on community institutions and life styles are limited. In each case, however, prospects for future effects on commercial activity and increased ridership are promising, although such effects are recognized to be dependent upon forces outside the system itself.

CONCLUSIONS AND IMPLICATIONS

Introduction

Our findings tend to confirm that BART is most successful at performing the service for which it was primarily designed: the provision of comfortable, high quality commuter rail service from the suburban periphery to the downtown central city employment and educational centers. While the system was specifically designed to serve the peak-period commuter traveler, it was also expected by some to improve the transit mobility of the urban transportation-disadvantaged population, to facilitate residential and commercial development in suburban clusters and within downtown urban cores, and to democratize and revitalize the participation by urban and suburban persons in the cultural, recreational, and retail services of the region. In general, it must be made clear that the public expectations of BART within the Bay Area far exceed the potential for social impact of a 71 mile arterial transit line that carries less than 3% of the areawide travel within a region with well articulated transit and highway networks. Clearly, a transit system cannot perform all of the transportation functions essential to the commerce and social life of a metropolitan region.

The BART experience clarifies the need to explicitly state and confront the policy alternatives facing planners of substantial new public transit developments. Clear decisions must be made about the priorities and costs and benefits associated with a number of different development options. In order to accentuate the positive impacts of transit development, transportation planning must be integrated with regional planning for economic and social development. In many cases, such integrated planning may require the cultivation or creation of wide-based community and interest group participation in the selection of alternatives and the choice among primary development options.

Without such a conscious process of cost-benefit analyses and informed participation of community representatives in the selection of development alternatives, the social impacts of a new, automated rail transit system are likely to disappoint the expectations of a variety of lay and professional publics. The symbolic and imagery impacts of a new system are likely to far outweigh tangible benefits in terms of clear improvements in mobility, and related positive impacts on the public life and the economic development of commercial, industrial, and residential uses.

The remainder of this chapter outlines some of the major social impacts of the system in order to gain insight into some of the "successes" and "failures" of BART. Policy implications are suggested and potential options are identified which might serve to accentuate or mitigate impacts.

Social Benefits and the Issues of Equity

It must be recognized that different groups of people will have different interests, service priorities, and conceptions of what priorities shall take preeminence. Given the present

system of operation, different segments of the community benefit in differing degrees, though in principle, equity in the social benefits of BART is desirable.

A major finding in this study is that work commuters to white-collar work centers benefit both financially and psychologically from BART availability. These benefits derive from at least three sources:

- The fixing of BART schedules and headways with fundamental priority to peak-hour commuting availability.
- The setting of the fare structure that benefits long trips from suburban peripheries of the system.
- The psychological quality of the service based upon providing efficient, comfortable, anonymous service.

However, transit-dependent populations who rely upon public transportation for both non-work and work travel, suffer from limited BART feeders for non-peak periods, and the absence of weekend BART service. These findings suggest the following issues for further discussion:

- Should priority be given to extension of service to weekends and late evenings? Fuller use of the BART system for non-work purposes requires that it be available during times when people tend to engage in non-work activities. Much of the recreational use, visiting with family and friends, and shopping excursions would naturally fall into the weekend and late evening time slots. When asked about system improvements, multiple-purpose BART users, transit-dependent persons, and younger people persistently and spontaneously saw the need for extension of service to weekends and late evenings.
- Should a policy of differential fare schedules more favorable to transit dependent and group travel be considered? Expansion of service to transit-dependent and non-work populations and uses may require consideration of alteration of fare schedules. Such considerations are consistent with the observations that result from a survey of expressed traveler concerns and the impact of reduced fares (e.g., Labor Day). Two different issues are distinguishable here: fare reductions for particular transit-dependent populations (e.g., youth and low income persons) and lowered fares for off-peak travel.

Fare and service schedule policies which stimulate the taking of trips by transit-dependent persons or usual non-travelers widen the effective service clientele and enhance the vitality of regional, social, economic, cultural, and recreational activities. A BART policy which brought new patrons onto the system for travel related to recreational, cultural, and educational activities would contribute to a major facet of the regional economy: tourism and recreational enterprises. At the same time, there would be potential social benefits of enhanced access and experience for more transit-dependent persons, more frequent use among a larger percentage of BART area residents, enhanced vitality of the region through increased participation in regional recreational and cultural activities, and revitalization of the public space. These changes would counter the present trend of increasing fear and reluctance to enter the public space for other than work or limited, car-based forays.

The Needs of Transit-Dependent Populations

BART presently makes available reduced fare tickets for youth under 12, handicapped persons, and senior citizens over 65. However, these tickets are available only at participating banks, rather than in the station ticketing areas. Our research findings suggest that drawing a substantial volume of these dependent populations onto BART will require easier ticket availability consistent with the life routines of these groups. In some cases, notably with senior citizens and youth, our research indicates that there is a need for sponsored orientation tours of the system. The formal availability of discount tickets has limited impact upon patronage when the travel alternative does not naturally occur within the rhythm, routines, and life experiences of the target population.

The Rider's Experience of BART's Non-Access Characteristics

A large part of the BART capital outlay for cars and car interiors was devoted to making BART a modern, high-class comfortable transit mode, in order to draw people out of their cars onto public transit. Our research findings confirm a view that BART is perceived in a very different way from the existing bus system. Both regular car drivers and public transit users comment on the social character of the patrons and the special quality and comfort of the BART car interiors. Interview respondents agree that because of its clientele and comfortable, pleasing environment, BART is safer, more attractive, and less threatening than the bus.

Many cars owners report that they would not use the bus but choose to commute on BART. Car owners who use BART for discretionary travel for recreation or shopping also report that they do not and would not use the bus. Among regular bus users, the BART traveling environment is generally perceived as more desirable but transit mode choice decisions most clearly reflect time, cost, and convenience considerations.

These findings suggest that BART's high-quality interior environment has a significant effect in encouraging patronage of the system and in stimulating the creation of a pleasant traveling environment. Policymakers might consider an investment in high-quality transit interiors whether contemplating an automated rail system or other transit alternatives.

Negative Experiences of the BART Travel Environment

However, some of the same factors which make the BART traveling environment convenient for the peak-period commuter appear to create psychological feelings of uncertainty and anxiety for some off-peak travelers. The automated character of the system combined with the absence of station personnel from platforms, and the long tunnel-like design of many BART stations serves to create feelings of insecurity and social unease among some off-peak and evening travelers. Particularly during the evening hours, the low visibility of station personnel and low patronage stimulate feelings of social fear among potential users. Older persons seem to find security on the bus in the presence of a driver who may be familiar to them. Women, in particular, responding in part to the 72:28 male to female ratio of BART nighttime travelers, express fears about using BART which exceed any objective danger of crimes against persons or property in the station area.

These findings, along with findings on the response to BART's automation suggest the policy need to rethink the commitment to automated fare collection and service facilities,

particularly in a social setting of growing energy and resource scarcity and rising unemployment in the labor force.

Non-Access Characteristics of BART: Policy Relevance

User comments on the non-access characteristics of BART have policy relevance for a number of issues. First, for persons to come to define public transit service in a positive way is a significant and necessary change. The redefinition of the public space as less threatening, more comfortable, and more pleasant as a transitional space between points is a first step toward encouraging greater use of public modes. BART's policy of removing damaged or vandalized cars from service may contribute to this public image. Physical amenities and comforts appear to be important features of the rider's experience and should be maintained at a high level. In turn, high-level maintenance can help to establish public mores which discourage littering and defacing of the BART system.

Of greatest significance, from a policy standpoint, is that most users of BART view it as substantially different from bus service. The positive response of most users to the quality, comfort, and ambience of high quality-rail cars appears to confirm the view that high-quality rail transit possesses non-access qualities of importance to consumers. Further, both car and bus users appear to clearly differentiate the characteristics of a high-quality rail environment from their conceptions and imagery of the bus. It must be cautioned, however, that these present images of BART may be based in part in its predominantly prosperous, white-collar clientele. It remains to be seen if democratization of use of BART through new service or new fare policies would contribute to a blurring of the present distinctions that are drawn between the quality and ambience of BART and the bus environment.

However, the likely fact of increased off-peak, evening, and group travel under reduced off-peak fares would likely contribute to humanizing the travel environment during present low-patronage periods. At the same time, it would serve to democratize the access to high-quality, more secure, comfortable facilities for those persons most dependent upon them, the off-peak transit dependent population.

In general, public policy decisions may also need to focus on the issue of security when considering the choices of automated or semi-automated facilities and when evaluating competing fare and operation policies.

Use of BART for Promoting the Sale of Goods and Services

BART access has been widely advertised in connection with the Oakland symphony, the Oakland Athletics (baseball) and Golden State Warriors (basketball), the circus, local cultural activities, local downtown department stores, sale of downtown office and commercial space and facilities and easy commuting from suburban housing and apartment developments. In many respects, the use of BART, as a promotional device for the sale of goods and services, is the commercial expression of organizations identifying themselves with BART as a symbol of a new transportation alternative. In some cases, such as the promotions for the circus, the symphony, and local sporting and athletic events, the commercial promoters joined forces with BART's marketing department to develop joint promotions to increase BART's general patronage and recreational patronage at these

specific recreational events. These alliances reflect the common organizational goals of attempting to increase patronage by improving the perceived ease of accessibility to a variety of events.

BART's impacts on the consumption of goods and services have not been large. However, BART appears to have a symbolic appeal to business and promotional people which exceeds its practical impact as a transit facilitator of consumer demand. For example, downtown Oakland merchants and downtown Oakland corporate interests and real estate developers have generally positive expectations about BART's potential impact. Businesses and developers are inclined to tie the images of their businesses with the image of BART in their promotional appeals. This promotional use of BART generally far exceeds any concrete evidence of BART's importance or success in the marketing of their goods and services. Further, it is clear that a new express bus service access would not generate this type of promotional appeal. The appeal of BART as a promotional device is based on its image as a new transportation alternative with fixed connections between residential and business locations. In this respect, at the symbolic level, BART does influence the conduct of business activity in the service region.

Development of weekend service, reduced off-peak fares, and coordination of transit planning with downtown development would all serve to contribute to the metamorphosis of symbolic positive impacts into more tangible impacts on the recreational and shopping activities of metropolitan residents within the BART service region.

INSTITUTIONAL IMPACTS

BART as a Symbol of a New Transportation Alternative

As the first automated rail transit system to be built in the United States, BART became a symbol of a new type of public transit. In its original presentation to the public by the planners of the system, BART was offered as a totally new type of ultra-modern transportation system. From this perspective, the administrators of a variety of social institutions readily identified BART as a symbol of the Bay Area's commitment to public mass transit which could be adapted to serve their particular institutional purposes.

Universities and colleges near BART took varying actions to stimulate BART use; these included public meetings and notices, surveys of access modes to campus, investigation of requirements for new BART feeders, and initiation of shuttle services to BART stations. Most institutions close to BART clearly associated their campuses with BART access in their promotional literature and advertising. However, while most administrators of institutions of higher education were ready to identify their institutions with BART, the majority took very limited steps toward actual commitment of resources for connections. Even the University of California, which readily committed itself to BART access with its Humphrey Go-BART feeder service, was fiscally reluctant or unable to provide the level of feeder service justified by the demand. In this respect, U.C. Berkeley was representative of the tension which existed for other educational institutions between the institutional commitment to the symbol of BART and actual changes in organizational policy or capital investment in connection with BART. However, even at campuses where there was substantial investment in BART feeder connections, the actual level of student BART ridership did not exceed ten percent of the student body.

Health care institutions located close to BART also acted to identify with the goal of promoting mass public transit access to their facilities. In the case of Kaiser Walnut Creek, the institution made a voluntary contribution of resources to help facilitate the City of Walnut Creek feeder service from the Walnut Creek BART Station to the Kaiser facility. Alta Bates Hospital, located mid-way between the Ashby and Rockridge BART Stations, held public and private staff meetings where it endorsed the use of BART by hospital staff and employees for their journey to work and conducted surveys and feasibility studies on the practicality of initiating a private hospital feeder service to and from BART.

In spite of such attempts to encourage BART use, patient and employee access by BART is low. Health care interviews at four health care institutions close to BART stations all indicate that most patients (even those without their own autos) much prefer to drive or be driven to the facility. BART and buses both appear to be unattractive travel alternatives for the patient seeking health care service. There was also a reluctance on the part of hospital employees to give up the freedom of schedule and movement associated with driving their own cars to work.

Organizations which are in the public trust or sensitive to public opinion easily come to publicly identify their institutional goals with the symbol of new transportation alternatives, which BART represents. However, they are unlikely to support this commitment with policy changes or expenditures on feeder services connecting the institutions with BART.

BART as a Facilitator of Family Interaction

By providing a new travel option for one-car families, transit-dependent adults and youth, BART enhances the mobility, supports the autonomous interaction of family members and in some cases facilitates the maintenance of relationships among segmented nuclear family members. This is true particularly in suburban areas which offer limited transit options, affecting particularly youth and older, transit-dependent adults. However, even where the alternative of bus travel is available, BART is likely to be considered a socially safer transit mode for children.

Among BART riders under the age of 18, there is a clear pattern of BART use for family visiting and visiting of separated parents. In addition, young riders use BART to attend private school, part-time jobs, lessons, and to go to concerts and athletic events, and to explore downtown areas. Thus BART gives youth a greater degree of control over their interactions with family members and their choice of activities, while freeing parents from the need to chauffeur. It contributes particularly to the developing independence and socialization of adolescent youth.

For transit dependent adults, BART facilitates more frequent visits with relatives in the region. Use of BART for this purpose is evident particularly among members of ethnic minorities. In one-car families, BART expands the possibilities for mobility and control over travel related to work, leisure, and shopping, supporting a process of productive segmentation and independence of family members.

These findings suggest that for those who make use of it, mass transit contributes to the interaction of family members in two major ways. It performs an integrating function for segmented families and extended families by encouraging more frequent visits. At the

same time, it supports the differentiation of routines among family members living in the households with limited car access.

BART as a Negative Symbol of Business and Big Government Interests

In two communities close to BART stations which were identified by planners as ideal locations for high density residential and commercial development, community organizations were created to oppose this development. Both of these community organizations - one in Oakland's Rockridge area and the other in San Francisco's Mission District - identified BART as part of a spreading regionalism which would undermine distinctive local neighborhood integrity. Present political trends within San Francisco, as well as movements in other metropolitan areas in the country, suggest that these groups represent a growing segment of local community interests opposed to community redevelopment activities which are an outgrowth of the goals of mass transit.

Similarly, some small merchants in downtown Oakland now tend to cynically identify BART and downtown redevelopment as serving the goals and interests of city government and big corporate interests. Their attitudes are partly a reflection of the real burden that smaller businesses bear when there are long periods of transit system construction and business relocation activities. At present, large segments of downtown Oakland remain undeveloped pending further commitments of new commercial clients. Potential clients are awaiting construction of new freeway access to downtown Oakland. This experience suggests that efforts must be taken to insure that smaller merchants are involved in planning and execution of new transit facilities in such a way that the new transit developments reflect the needs and interests of the smaller merchant.

One clear policy implication is for public planners to actively and routinely seek the counsel of local merchants and residents, as they do of chambers of commerce and organized business groups, before decisions to rezone, develop, or locate a mass transit station in or near a given residential area are made. Policy makers may need to establish a program to provide for public interaction in the planning process in order to insure that all segments of the local constituency have a voice. This program should include systems for informing the public of the status and direction of the planning effort and incorporate a timetable for public review and comment upon planning documents and related materials and evidence. Citizens should be able to offer evidence, and to trace their input through the planning process.

Present federal UMTA policy and state environmental protection legislation make the development of public participation and public input an obligatory feature of planned transportation developments. In this respect, present policies represent an advance over the period of BART's emergence. However, the "policy" of public participation often presumes an existing structure that can interpret and administer a set of findings, directives, or goals. Most people are not actors within such a structure. Yet these same people have demonstrated the importance and relevance of their concerns, perceptions, and conclusions, even though they may be outside the realm of traditional, professional policy making.

The consideration of community perceptions and conclusions may relate more to what may be called "action," or the mobilization of non-official, non-governmental groups or constituencies, than it does to conventional planning techniques. Moreover, important

implications get lost when everyone concerned is busily searching for the conduits of existing structures. It may be necessary to re-design the structure to meet the needs and divergent foci of particular communities.

A significant policy implication of the present research then, is the recommendation that mass transit authorities and planners create and develop an "action" wing or liaison whose function is to monitor and, if necessary, develop local constituencies to organize and mobilize opinion, even if it sometimes counters the interests represented by the policy makers themselves, and to sustain such local political mobilization.

Local activists have demonstrated the imprudence of under-emphasizing the need for and importance of this function which should become an integral part of the planning process.

Transferability of Conclusions

The development of a new transit system can be expected to have limited social and psychological impacts on those who adopt its use as part of their life routines. Similarly, social institutions within the service area are likely to experience small impacts from the presence of a new access alternative. The specific nature of these impacts and the responses they generate, however, will be determined by the characteristics of the new transit system and the social fabric into which it is introduced.

The characteristics of the impacts of a new transit system will be determined to a large extent by the design of the system and the influence of existing highway and transit networks. However, characteristics of the physical environment and the social fabric of the area, a weaving of such intangibles as the cultural traditions, historical development, climate, and regional geography, exert direct and indirect influence on the social impact of a new rail transit system. A valid transference of conclusions about BART's impacts on the Bay Area life styles and institutions to other areas can occur only with a sensitive understanding of the particular social and cultural circumstances of the other areas in relationship to the social and cultural makeup of the BART service area.

Some of the factors which appear to have substantial influence on Bay Area social patterns as they relate to the social impacts of BART are these:

- The relative "newness" of the area in terms of its urban development relative to the traditions of the American culture
- The strong historical presence of the Spanish cultural influence within the Bay Area
- The cosmopolitan, international orientation of a Pacific rim port and trade center
- The importance of tourism to the regional economy
- A more leisurely sense of time, related in part to the year round moderate weather patterns, which leads to a greater acceptance of delays than might be expected in the urbanized Northeast
- A sense of "image," related in part to the physical beauty of the Bay Area setting, which leads to an appreciation of and respect for high aesthetic and "environmental" quality

- An apparent identification of independence with mobility in general and with the personal travel mode of the automobile in particular
- The existence of a well-developed, high-quality freeway network
- Existing comprehensive bus and streetcar systems through much of the BART service area which provide service on schedule and/or at close frequencies

These factors and others work together to become part of the transportation-related behavior and common mentality of Bay Area residents. The parallel structural and cultural factors determining the attitudinal framework of residents in other areas may be of a different nature, and other strong influences may be at work. These are some of the factors to be considered in transferring the findings presented here to other situations.

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